News about

B. F. Goodrich Chemical *raw materials*

Good-rite
Reg. U.S. Pat. Off.

VULTROL

good cure for scorch problems

Vultrol gives you good protection against scorching in compounding natural and GRS rubbers. It is an efficient retarder at processing temperatures, a mild activator at curing temperatures.

Vultrol is a particularly effective ingredient in compounds loaded with high abrasion furnace blacks, and offers advantages with many other highly loaded and highly accelerated compounds.

Vultrol is very effective in recovering aged uncured, scorched, or bin cured stocks. It prevents further scorch during processing of these stocks, and does not interfere with their final cures.

Good-rite *Vultrol* requires no special handling, is supplied as a free-flowing flake. It is economical and easy to use. For complete information, please write Dept. CJ-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Good-rite
Reg. U.S. Pat. Off.
Rubber Chemicals

GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

PHILBLACK® A

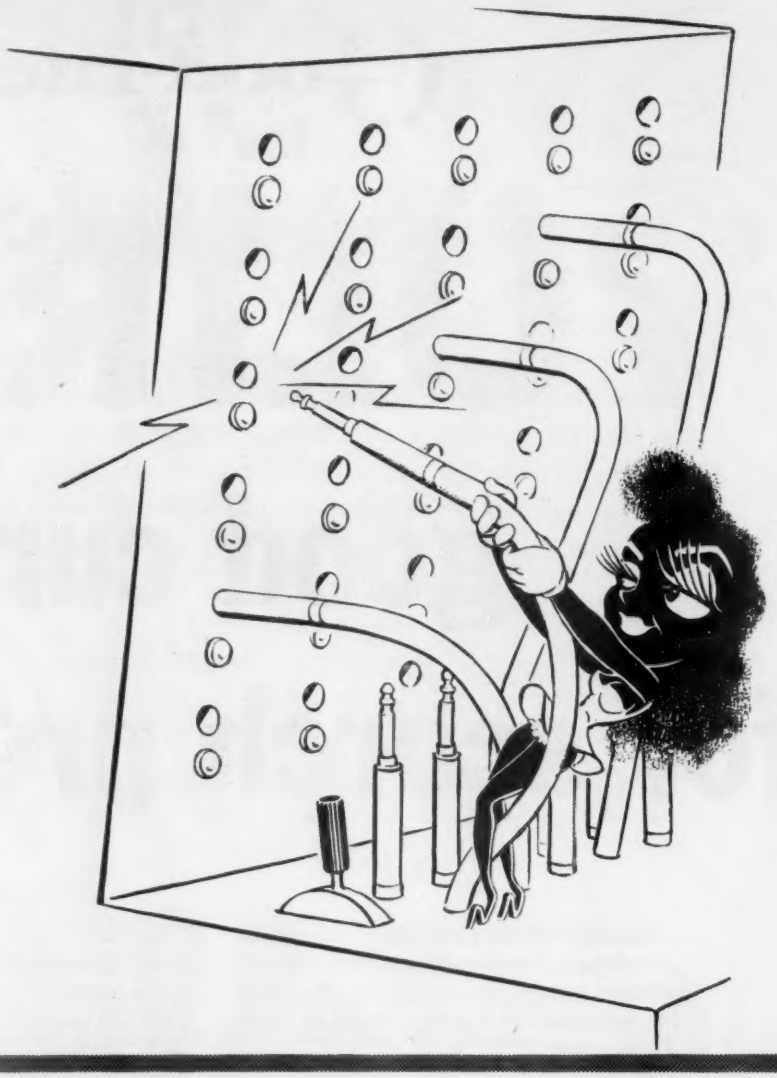
Makes Better Cable Coverings!

It's PERFORMANCE that counts! And Philblack A insures remarkable extrusion performance in a wide variety of rubber stocks. With Philblack A in your recipe, extruded surfaces are exceptionally smooth in all shapes from thin wall tubing to intricate channel strips.

Long flex life and excellent stress-strain properties make Philblack A compounds ideal for wire and cable jackets. No processing troubles, either, with Philblack A. It handles easily . . . incorporates rapidly . . . helps you get the maximum in trouble-free performance with any type of equipment.

Each Philblack has its own special advantages, thus assuring unusual flexibility in your rubber recipes. To make *good* products *better*, use the proper Philblack letter: A, O, I or E.

For complete information, consult our Technical Representative.



Know the Philblacks!

KNOW WHAT THEY'LL DO FOR YOU!

A **Philblack A FEF Fast Extrusion Furnace Black**
Ideal for smooth tubing, accurate molding, satiny finish. Mixes easily. High, hot tensile. Disperses heat. Non-staining.

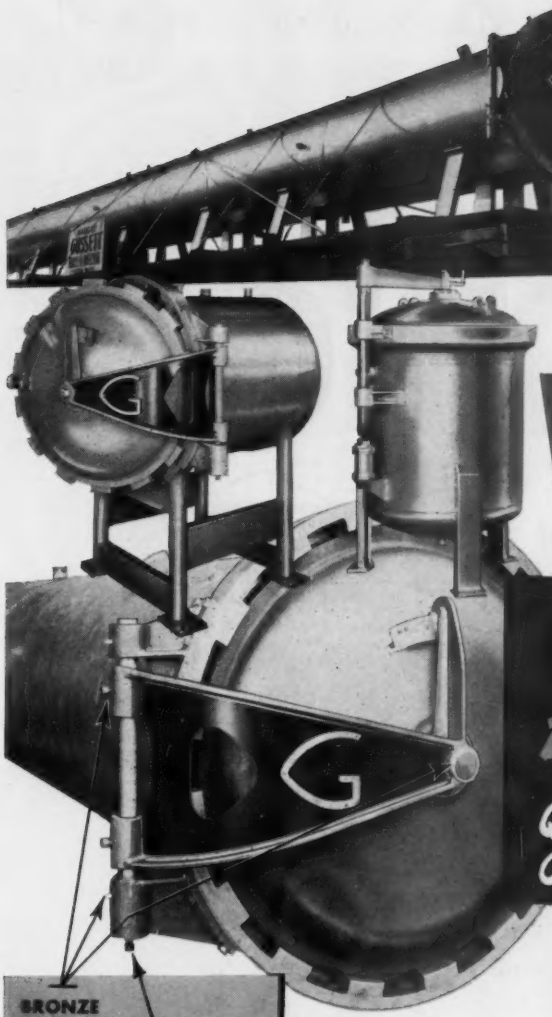
O **Philblack O HAF High Abrasion Furnace Black**
For long, durable life. Good electrical conductivity. Excellent flex. Fine dispersion.

I **Philblack I ISAF Intermediate Super Abrasion Furnace Black**
Superior abrasion resistance at moderate cost. Very high resistance to cuts and cracks. More tread miles at high speeds.

E **Philblack E SAF Super Abrasion Furnace Black**
Toughest black on the market. Extreme abrasion resistance. Withstands aging, cracking, cutting and chipping.

Phillips 66

PHILLIPS CHEMICAL COMPANY, Rubber Chemicals Division, 318 Water St., Akron 8, Ohio. Export Sales: 80 Broadway, New York 5, N. Y. West Coast: Harwick Standard Chemical Company, Los Angeles, California. Canada: H. L. Blachford, Ltd., Montreal and Toronto.



GUSSETT

VULCANIZERS

WITH

GUSSETT EASY GLIDE QUICK OPENING DOORS

Cost Less to Own ...Less to Operate

Safe, Fast, Easy Door Operation

Note use of heavy lubricated bronze bushings at all wearing points and thrust bearing to support weight of door.

The Gussett Easy-Glide Quick-Opening Door is the result of almost forty years of practical experience in designing and building processing equipment for the rubber industry.

Fabricated of heavy steel plate, it offers high strength and a higher factor of safety without excessive weight. Precision machining insures accurate seating and freedom from leakage.

The large-diameter hinge pin and door center pin turn in heavy, pressure-lubricated bronze bushings and the weight of the door is supported by heavy-duty roller thrust bearings to minimize time and effort required to open and close the door and insure long, trouble-free service. Hundreds of Gussett Easy-Glide doors are in use all over the world.

Easy-Glide Doors are furnished without extra cost (often at important savings) on all Gussett-built Vulcanizers . . . horizontal or vertical . . . 18 inches and larger . . . any desired length . . . for any working pressure up to 600 pounds.

WRITE OR WIRE FOR BULLETIN

GUSSETT BOILER & WELDING, INC.

1545 Whipple Road S. W. • Canton 10, Ohio

BETTER BIN AGING-

another advantage of using CHEMIGUM

Bin aging is a characteristic of rubber which often is not given adequate consideration. It can be important for two reasons. First, it can affect the processing of the rubber. Second, it can affect the service life of the end product.

Different types of rubber age differently. Among the oil-resistant types, for instance, the chloroprenes tend to crystallize, while the nitriles generally become tougher. Both of these changes make processing more difficult, cause excessive heat build-up during mixing, increase power consumption of the equipment—result in lower product performance at higher cost.

But problems caused by poor bin aging can be minimized in your plant with CHEMIGUM—first, now finest of the nitrile rubbers. Results of a recent, extensive series of accelerated heat-aging tests (see partial data on opposite page) show the various grades of CHEMIGUM to be much superior to comparable grades of most other rubbers in this property. In fact, CHEMIGUM maintains its plasticity in much the same manner as natural rubber.

Better bin aging with its assurances of minimum inventory problems and more consistent production is just one of the many advantages of using CHEMIGUM. Quality, uniformity, outstanding ease of processing, excellent resistance to oils, greases and solvents and generally above average physical properties are others, not to mention the new, lighter color and the smaller bale.

Why not learn more about CHEMIGUM, today? Your request will be promptly answered with literature and/or samples plus the offer of full technical assistance. Just write to:

Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

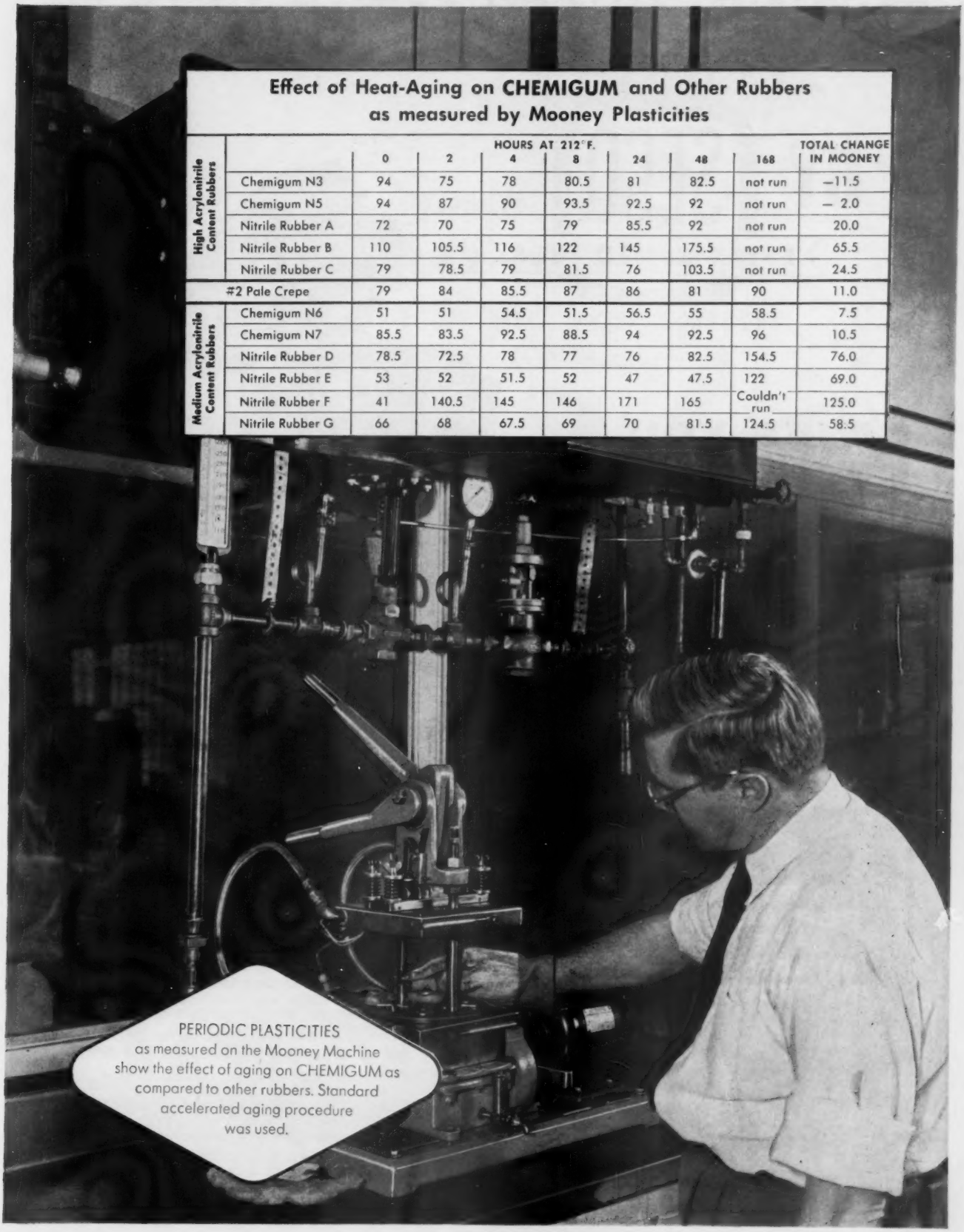
Chemigum, Pliobond, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

The Finest Chemicals for Industry—CHEMIGUM · PLIOBOND · PLIOLITE · PLIO-TUF · PLIOVIC · WING-CHEMICALS

CHEMIGUM ... another quality product of Goodyear Chemical Division

Effect of Heat-Aging on CHEMIGUM and Other Rubbers as measured by Mooney Plasticities

		HOURS AT 212°F.							TOTAL CHANGE IN MOONEY
		0	2	4	8	24	48	168	
High Acrylonitrile Content Rubbers	Chemigum N3	94	75	78	80.5	81	82.5	not run	—11.5
	Chemigum N5	94	87	90	93.5	92.5	92	not run	— 2.0
	Nitrile Rubber A	72	70	75	79	85.5	92	not run	20.0
	Nitrile Rubber B	110	105.5	116	122	145	175.5	not run	65.5
	Nitrile Rubber C	79	78.5	79	81.5	76	103.5	not run	24.5
#2 Pale Crepe		79	84	85.5	87	86	81	90	11.0
Medium Acrylonitrile Content Rubbers	Chemigum N6	51	51	54.5	51.5	56.5	55	58.5	7.5
	Chemigum N7	85.5	83.5	92.5	88.5	94	92.5	96	10.5
	Nitrile Rubber D	78.5	72.5	78	77	76	82.5	154.5	76.0
	Nitrile Rubber E	53	52	51.5	52	47	47.5	122	69.0
	Nitrile Rubber F	41	140.5	145	146	171	165	Couldn't run	125.0
	Nitrile Rubber G	66	68	67.5	69	70	81.5	124.5	58.5



PERIODIC PLASTICITIES as measured on the Mooney Machine show the effect of aging on CHEMIGUM as compared to other rubbers. Standard accelerated aging procedure was used.

A BANBURY INTERCHANGE

BY SECO
ESTABLISHED 1868

SAVES YOU WEEKS OF *COSTLY DOWN TIME*

Ready for Shipment

TIME IS MONEY

PARTS FOR ALL SIZE MIXERS IN STOCK

A SECO rebuilt Banbury body, now available on our Guaranteed Interchange Plan, saves you money two ways—

- *Reduces to a minimum lost production through mixer down time.*
- *Restores operating efficiency to new-equipment level.*

Both of these factors represent time, and *time is money*.

SECO engineered rebuilding of Banbury bodies by skilled technicians, combined with material and construction improvements, assures you of top operating efficiency and dependability—backed by the guarantee of manufacturers of high-precision machinery since 1868.

Your letter, wire or telephone call will bring one of our Engineers to your plant—without cost or obligation—to give you the details of our Guaranteed Interchange Plan.

SKINNER · ENGINE · COMPANY

SECO ESTABLISHED 1868

RUBBER MACHINERY DIVISION
TELEPHONE ERIE 2-3661
ERIE 6 · PENNSYLVANIA

TY·PLY®

NEW
UP - RC

BOND IS UNAFFECTED BY EXPOSURE TO OZONE

TY-PLY "UP" . . . the new Universal Primer and TY-PLY "RC" . . . the improved Rubber Cover Cement are exceptionally suitable for natural rubber stocks (both normal and low-sulfur), standard and cold-polymerized GR-S's, polybutadiene, oil-modified GR-S, arctic-type GR-S and natural-GR-S blends. Both adhesives have excellent shelf and working stability; are insensitive to weather or ozone conditions; and work well over a wide range of curing temperatures.

TY-PLY "Q" or "3640"
for bonding Natural, GR-S, and Butyl

TY-PLY "BN"
for bonding N-types

TY-PLY "S"
for bonding Neoprene

TY-PLY will adhere most vulcanizable rubber compounds to almost any clean metal surface

Marbon

MARBON CHEMICAL
Division of BORG-WARNER
GARY, INDIANA

TY-PLY has stood the test of time . . . since '39

From friction tape to conveyor belts...

FABRICS FOR EVERY PURPOSE

Imagine a vast array of fabric sample "swatches" spread over the product out-put and processing materials of the rubber industry and you have a practical idea of the range of fabric constructions available from Wellington Sears.

You'd have to include sturdy cotton and high tenacity rayon belt and hose ducks . . . sheetings . . . chafers . . . filament nylon . . . Army ducks spun rayon and nylon fabrics. These and many other cotton, synthetic and combination fabrics in a variety of weights and widths —all would be represented.

Of course, what you won't see is the variety of fabrics not yet in existence—those we will develop for specific rubber-and-fabric problems of our customers. If you have such a problem, why not let Wellington Sears help you find the answer?

Write us for illustrated booklet "Modern Textiles for Industry."

Wellington Sears

A Subsidiary of West Point Manufacturing Company

FIRST In Fabrics For Industry

For Mechanical Goods, Coated Materials, Tires, Footwear and Other Rubber Products

Wellington Sears Co., 65 Worth St., New York 13, N. Y. • Atlanta • Boston • Chicago • Dallas • Detroit • Los Angeles • Philadelphia • San Francisco • St. Louis

GOOD NEWS FOR RUBBER USERS
PHILPRENE®
POLYMERS
PHILPRENE®
MASTERBATCHES
PHILPRENE®

...introducing PHILPRENE®

Acquisition of Plains butadiene and copolymer plants by Phillips Chemical Company means that Phillips shifts from contract operator for the Government to the private manufacture and sale of synthetic rubber under the trademark "Philprene."

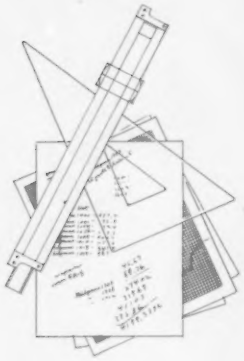
Phillips is not a manufacturer of rubber goods but expects to exert every competitive effort to produce Philprene polymers and masterbatches to meet the varying needs of the hundreds of manufacturers of rubber goods in the United States.

Butadiene plant, foreground, dehydrogenates high purity normal butane in two steps. A pipeline delivers 98% minimum purity butadiene to integrated copolymer plant, background.

Each is identical to former GR-S with the same numerical designation except 1605 and 1803 as noted below

CURRENT PHILPRENES	HOT	COLD	COLD OIL EXTENDED
POLYMERS	PHILPRENE 1000 PHILPRENE 1001 PHILPRENE 1004 PHILPRENE 1006 PHILPRENE 1009 PHILPRENE 1010 PHILPRENE 1018 PHILPRENE 1019	PHILPRENE 1500 PHILPRENE 1502 PHILPRENE 1503 NOTE: PHILPRENE 1019 AND 1503 ARE ESPECIALLY DESIGNED FOR THE WIRE AND CABLE INDUSTRY	PHILPRENE 1703 PHILPRENE 1706 PHILPRENE 1708 PHILPRENE 1711 PHILPRENE 1712
MASTERBATCHES	PHILPRENE 1100	PHILPRENE 1600 PHILPRENE 1601 PHILPRENE 1602 PHILPRENE 1605 New polymer	PHILPRENE 1803 similar to GR-S 1801 but incorporating 25 parts Philrich 5

Complete Technical Service



As a rubber goods manufacturer, you have at your command the full resources of our Sales-Service Laboratory and technical staff.

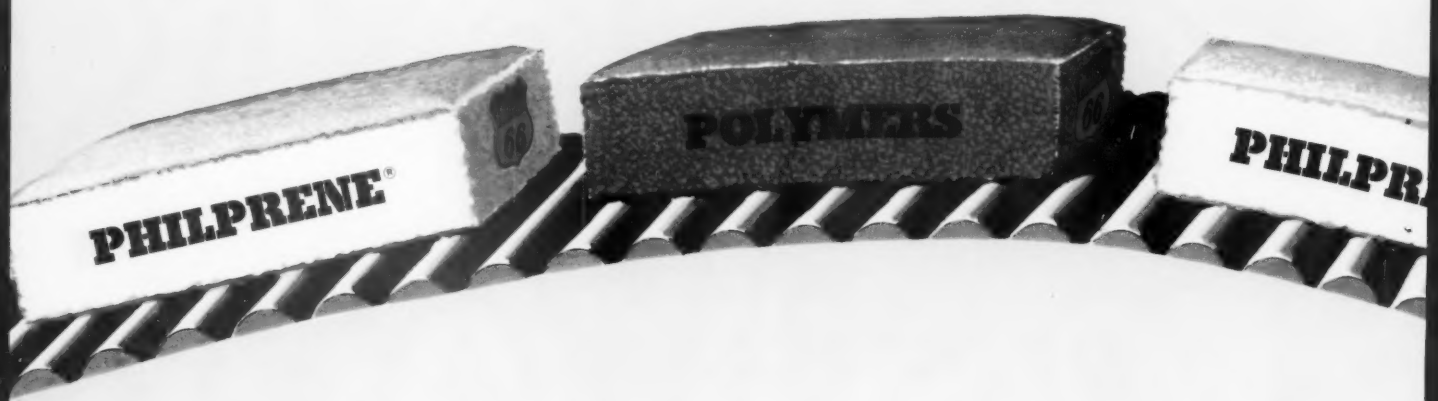
For nearly two decades now, we have been seriously and intimately concerned with the successful end use of rubber compounds.

Yet we are not manufacturers of rubber goods ourselves.

Indeed, the success of our PHILPRENE venture rests entirely on the efficient, economic use of PHILPRENE by hundreds of companies outside our own organization.

Perhaps that is why our Technical Representatives are always able to put all the cards on the table. Our single aim is to supply you with every bit of technical aid and assistance you require to improve your profits and cut your costs.

Call on us – anytime – for full information on the applications PHILPRENE has in your operations. There's no obligation. We're glad to help.



PHILLIPS CHEMICAL COMPANY
Rubber Chemicals Division
318 WATER STREET • AKRON 8, OHIO

HOW FARREL-BIRMINGHAM CAN *BLUEPRINT* YOUR WAY TO INCREASED PRODUCTION EFFICIENCY

The Farrel-Birmingham Engineering Planning Division can benefit you in two ways. Provide you with a layout that will help you cash in on the potential of existing equipment, or devise the ideal setup for your particular production aims.

A layout is composed of production machines matched in capacity to prevent "choking or starving" of succeeding units. Production flows without costly interruption. Manual aid and supervision are cut to a minimum.

Farrel-Birmingham designs these layouts to meet widely varying physical and economic requirements. Our engineers will work with your engineers to help you select the right system for your needs.

Send for details of processing setups, and ask for information about any of the production units listed below.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

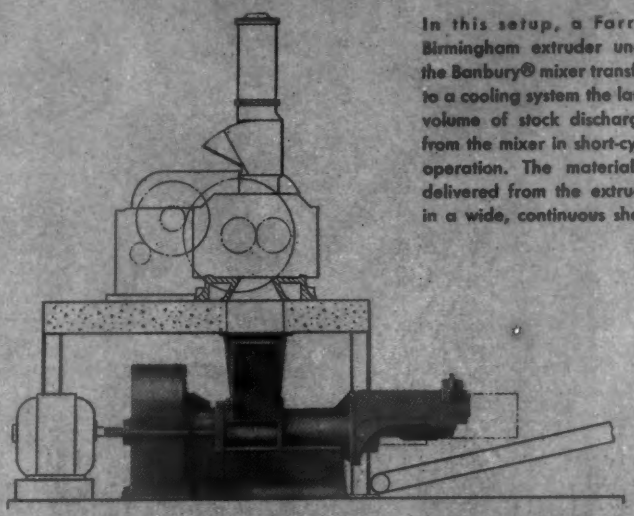
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Fayetteville (N. C.), Los Angeles, Houston

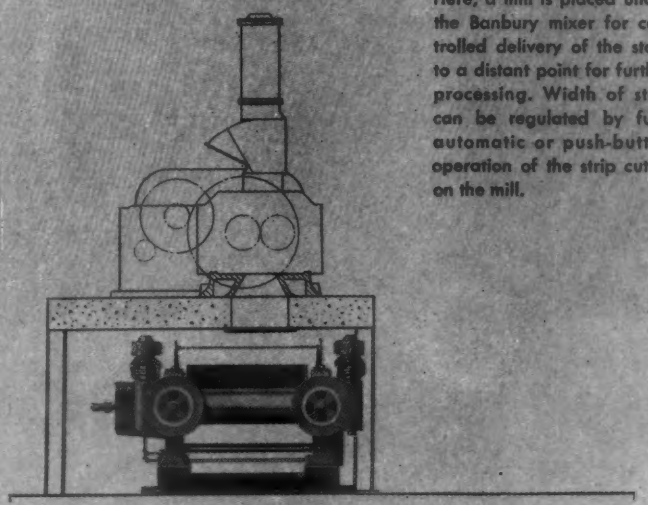
FB-999

F-B PRODUCTION UNITS

Banbury Mixers • Plasticators • Pelletizers • Extruders • Calenders • Mixing, Grinding, Warming and Sheeting Mills • Refiners • Crackers • Washers • Hose Machines • Bale Cutters • Hydraulic Presses and Other Equipment for Processing Rubber and Plastic Materials.



In this setup, a Farrel-Birmingham extruder under the Banbury® mixer transfers to a cooling system the large volume of stock discharged from the mixer in short-cycle operation. The material is delivered from the extruder in a wide, continuous sheet.



Here, a mill is placed under the Banbury mixer for controlled delivery of the stock to a distant point for further processing. Width of strip can be regulated by fully automatic or push-button operation of the strip cutter on the mill.

Farrel-Birmingham®

Easy does it with **SOLKA-FLOC!**

If you manufacture floor tile, rubber soles, or any other rubber product, you can do it faster and easier with SOLKA-FLOC.

Reduced blistering and nerve . . . better dispersion . . . controlled shrinkage . . . high dimensional stability . . . sharper designs . . . harder, smoother surfaces — SOLKA-FLOC works many different ways to give you a better finished product.

A finely-divided wood cellulose, SOLKA-FLOC will speed up your production, improve your product, increase your profits.

For samples and careful consideration of your specific processing problems, write Dept. FG-5, our Boston office, and one of our representatives will call on you.

BROWN

COMPANY, Berlin, New Hampshire

General Sales Office:
150 Causeway Street, Boston 14, Mass.

SOLKA PULPS • SOLKA-FLOC • NIBROC PAPERS
NIBROC TOWELS • NIBROC KOWTOWLS • NIBROC
TOILET TISSUE • BERMICO SEWER PIPE AND
CONDUIT • ONCO INSOLES • CHEMICALS

CALCENE® TM
CALCENE® NC

. . . for increased quality
superior whites or light colors
reduced costs

These two Columbia-Southern companion pigments offer unusual advantages to rubber compounders.

Calcene is easy to use and it disperses readily. Costlier pigments can be replaced fully or partially. In some cases Calcene makes it possible to eliminate the masterbatching step while retaining a high level of properties.

Calcene adds quality to the finished compound. Whites and pastels possess superior properties, especially high hot tear resistance.

Columbia-Southern's technical staff will be glad to supply you with experimental working samples and to work with you directly in solving your individual problems. Contact our Pittsburgh office today.

CALCENE is a white, precipitated calcium carbonate of fine particle size. Calcene TM is coated; Calcene NC is non-coated.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte
Chicago • Cleveland • Boston • New York
St. Louis • Minneapolis • New Orleans
Dallas • Houston • Pittsburgh • Philadelphia
San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

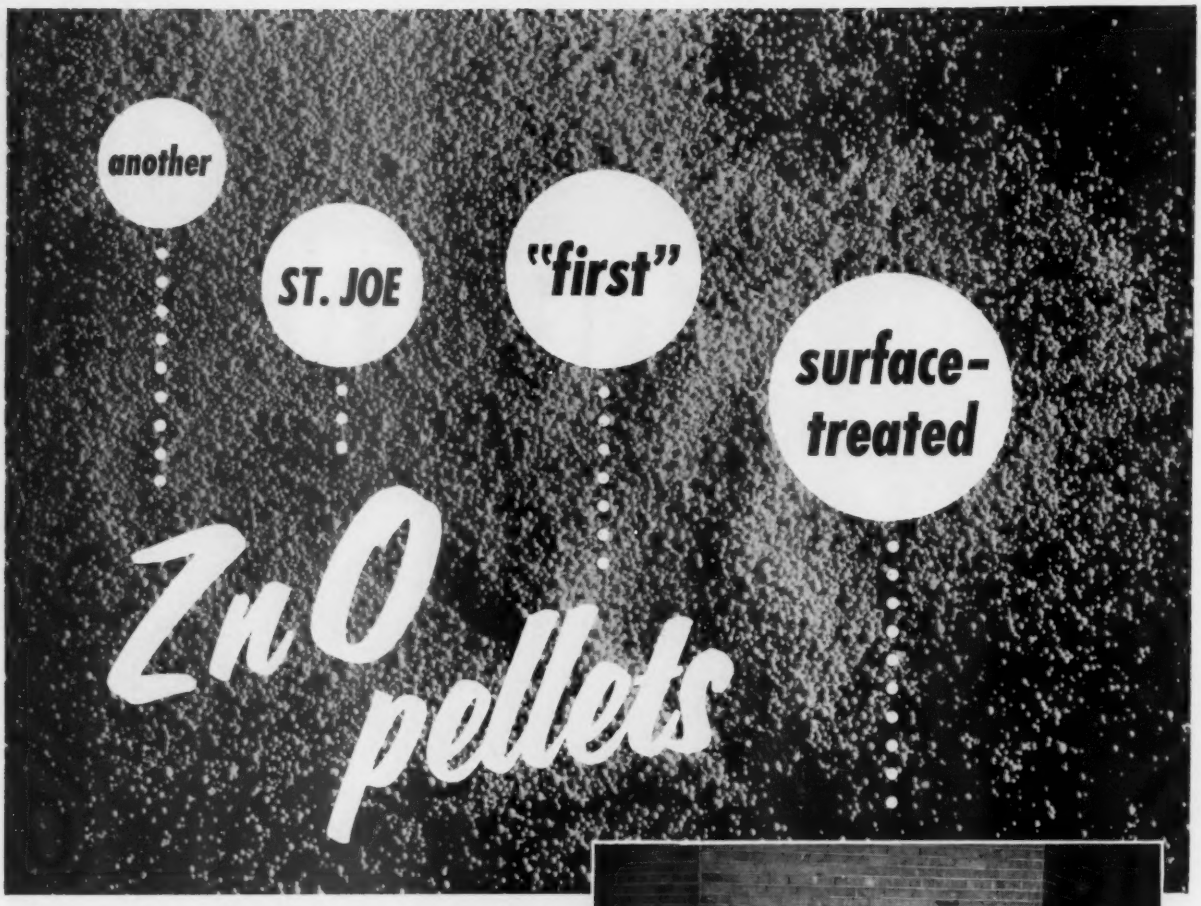


Photo of St. Joe surface-treated Zinc Oxide in pellet form, actual size.

(Note reduction in storage space required)

THE ST. JOSEPH LEAD COMPANY is now ready to ship ST. JOE surface-treated ZINC OXIDE in pellet form to consumers in the rubber industry. This "new look" in our product has been worked out successfully with a number of our customers. They have adopted it for all their shipments because – after repeated factory tests – the use of ST. JOE surface-treated ZINC OXIDE in the new pellet form was found to offer the consumer these definite advantages:

- *Free-flowing—improved handling properties*
- *Freedom from dustiness—better plant housekeeping*
- *Faster incorporation in rubber*
- *Superior dispersion in rubber*
- *Less storage space required owing to 50% increase in apparent density*

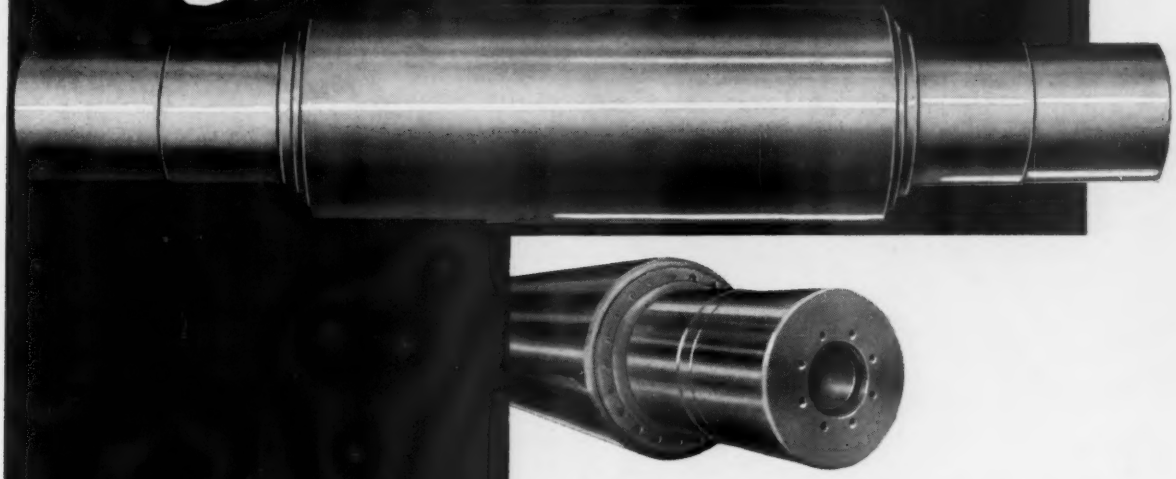
For your next shipment, specify ST. JOE surface-treated ZINC OXIDE in PELLET FORM

ST. JOSEPH LEAD COMPANY

250 PARK AVENUE, NEW YORK 17 ***Plant & Laboratory, Monaca (Josephtown) Pa.***

Where

Specify DRILLED-TYPE® ROLLS



UNITED Precision Ground, DRILLED-TYPE ROLLS, the result of careful metallurgical control over raw materials, and of strict quality control in every phase of manufacture . . .

MAINTAIN A UNIFORM ROLL SURFACE TEMPERATURE throughout, with minimum deviation at any point.

ASSURE FULL RANGE HEATING and cooling over wide temperature ranges.

PROVIDE ACCURATE, QUICKLY RESPONSIVE TEMPERATURE CONTROL.

UTILIZE FULL ROLL FACE with new, ring closure type designs.

PERMIT ADJUSTMENT OF RING CLOSURE GASKET AND BOLTS, WITH ROLL IN PLACE in calender or mill, thus eliminating production downtime due to roll removal.

MAINTAIN CORRECT DEPTH OF CHILL for iron or alloy iron rolls.

ARE ENGINEERED AND DESIGNED FOR MAXIMUM HEAT TRANSFER RATE with accurately drilled, fluid passages.

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at • Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington (Lobdell United Division)

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

PolymelDX

may be the answer to your problem!

Many compounders are using versatile POLYMEL DX to solve a variety of problems. For example, this low-cost styrene copolymer resin is being used

- In Extruded Goods—for easy processing, high speed operation, good lubricating action, and good retained outline in the uncured state;
- In High Styrene Compounds—to lower costs by reducing significantly the quantity of high styrene resin without lowering physicals;
- In MOLDED GOODS—for easy processing, good mold flow, excellent detail, and reduced shrinkage;
- In Calendered Goods—for easy processing, fine surface finish and faithful retention of embossed details;
- In Heel, Sole and Slab Stocks—to impart good physicals and easy processing properties to highly loaded stocks.

If your problem is among these, you owe it to yourself to try POLYMEL DX at once. Available in powder or 2" lump form, we will be glad to send a generous sample on request.

Prices fob Baltimore		
	1 drum to 4900 lbs.	— .1475¢ lb.
	5000 lbs. to truckloads	— .1425¢ lb.
	Truckloads	— .1375¢ lb.

THE POLYMEL CORPORATION

MANUFACTURERS OF
compounding ingredients for reinforcing, plasticizing, extending and processing natural and synthetic elastomers.

Plaza 2-1240 — 1800 BAYARD ST., BALTIMORE 30, MD.

RELIABLE ZINC OXIDES

AZO-ZZZ-44 and AZO-ZZZ-55 assure good dispersion and easy processing because of their uniform particle size and absence of extreme fines. With AZO-ZZZ-11, 22, 33, (Acicular types) and special grades, a complete range of zinc oxides is offered for every rubber requirement.

A RELIABLE SOURCE

American Zinc assures an uninterrupted supply of zinc oxide. Recent discovery and development of a new, large ore body, added to previous American Zinc reserves, provides sufficient ore to last many years at the current rate of production.

AZO ZZZ-44 ZZZ-55

AMERICAN ZINC SALES COMPANY

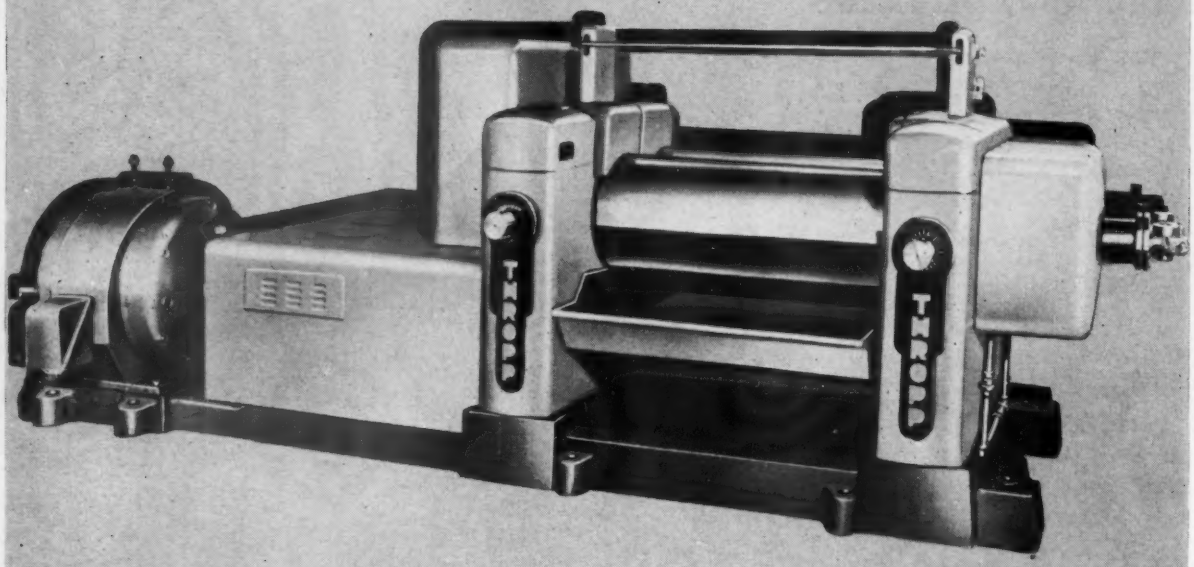
distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

COLUMBUS, OHIO • CHICAGO • ST. LOUIS • NEW YORK

The THROPP 60" MILL

earns the confidence of management



Thropp 22" x 22" x 60" Mill

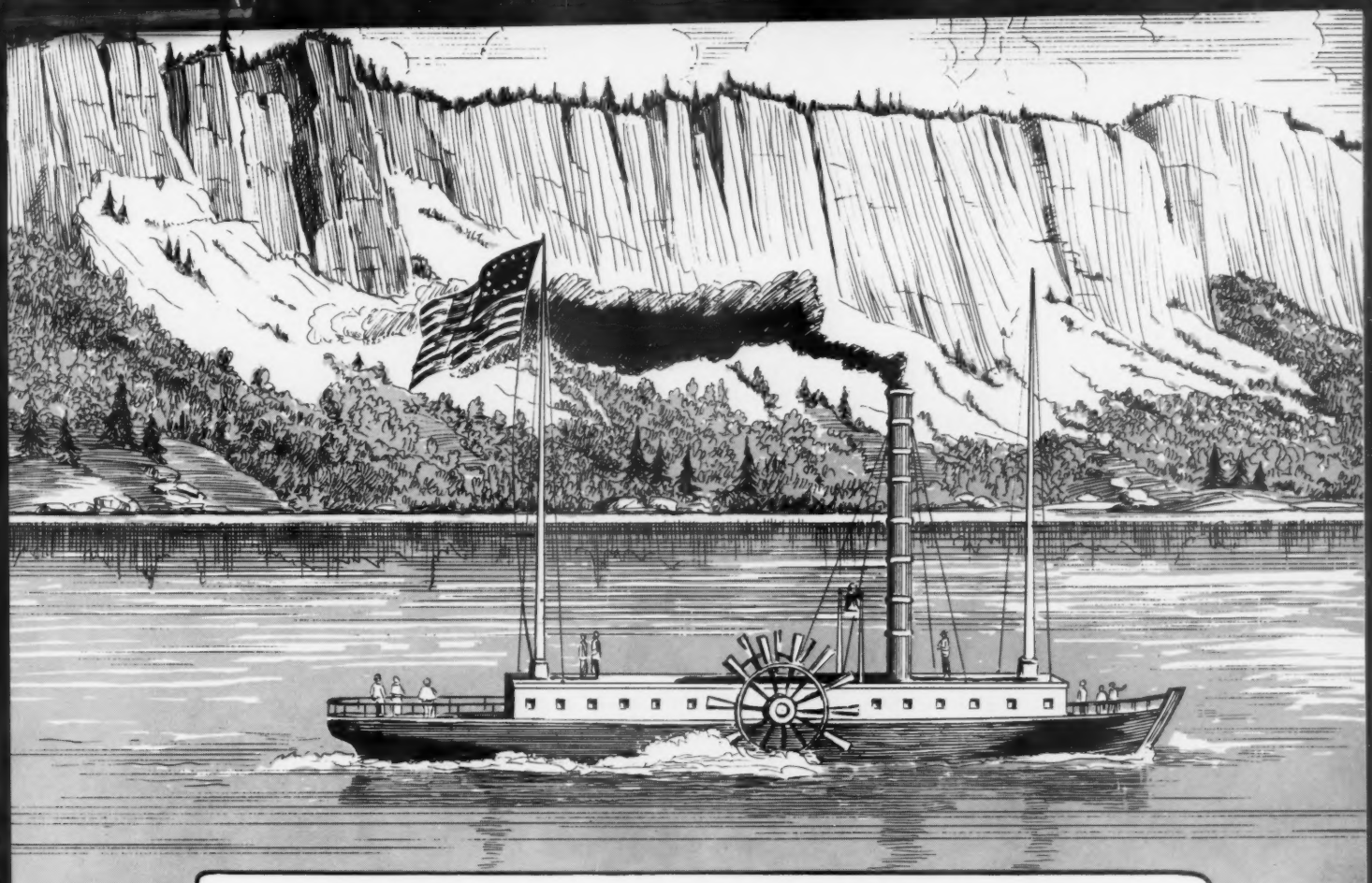
This clean, streamlined Mill is a real workhorse, designed and built in every detail for dependable, uninterrupted production in the Rubber and Plastics Industries.

send for complete information

Wm. R. THROPP & Sons

Division of J. M. LEHMANN COMPANY, Inc.

555 NEW YORK AVE., LYNDHURST, N. J.



Sawmill on the Way to Albany

One of a series on transportation and famous trails.

Early in the spring of 1807 at the shipyard of Charles Brown on East River, and under the direction of Robert Fulton, construction began on the S.S. Clermont. Both then and weeks later when the machinery was being installed, the strange craft was the subject of as much talk and criticism, as though it had been Noah's Ark, an early historian states.

In August the S.S. Clermont was ready for its maiden trip — to Albany. With several distinguished guests aboard, the boat got under way and headed up the Hudson river. Pine was used for fuel, which sent immense columns of showering sparks and black smoke from the tall smokestack. It is said that crews of other vessels along the way were appalled at the sight, especially after dark. As the Clermont passed the Palisades the clanking of its machinery and the noise of its paddle wheels so startled a farmer that he ran home to tell his wife that he had just seen "the devil on his way to Albany in a sawmill."

Fulton reached Albany, having traveled at the rate of 5 miles per hour for the full 150 miles. (The return trip was two hours quicker.) This was the first voyage of any considerable length ever made by a steam vessel.

Quickly in the years that followed the rivers of the United States became great highways for commerce. Up and down the Ohio the steamboats went, on the Mississippi and other inland waterways. A score of years later Indians in the far west heard steamboat whistles far up the wide Missouri. A continent was further opened and a great step forward was taken in the hauling of commerce.

Today man transports himself and his goods wherever he wishes to go. Neither proximity to a river nor to a railroad is any deterrent whatsoever in the swift haulage of the products of farm and factory. The rubber tire carries the greater part of the commerce of the day. Durable, dependable with long life and economy built into it, the rubber tire is equal to today's demands in every way.

It is carbon black which imparts these wearing qualities. UNITED BLACKS helped pave the way through research and engineering, thus contributing to the high standards which the modern tire represents.

UNITED CARBON COMPANY, INC.

Dixie 70 is foremost among ISAF (intermediate super-abrasion furnace) carbon blacks. It is the invariable choice of discerning compounders for tubeless tires, premium tires and first line quality tires.

Dixie 70 is expertly made by masters in carbon black manufacture to satisfy the most exacting specifications of tire makers who insist on the best.

Dixie 70 is today's black for today's needs and is dependable for exceptional performance and unblemished service.

There are Dixie Blacks for practically every purpose. They will help you stay ahead.

UNITED CARBON COMPANY, INC.

CHARLESTON 27, WEST VIRGINIA

NEW YORK AKRON CHICAGO BOSTON MEMPHIS

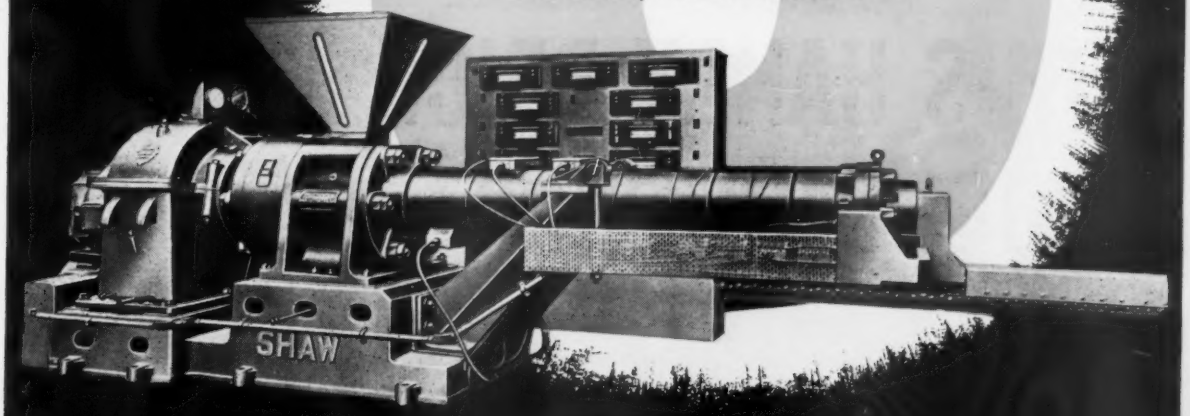
the big machine with the big features

SHAW

* *8" dia screw Various designs for special purposes*
* *Variable Speed Drive*
* *Screw speed indicator*
* *Separately controlled electrically heated zones*
* *Hopper temperature indication*

8" PLASTIC EXTRUDER

* *Water cooling of screw and feedbox*
* *Die heads for Rigid Piping, Sheeting and paper coating (as illustrated) and miscellaneous sections*
* *Other sizes of machines are available*



Industry's headquarters for the best in Rubber and Plastics Machinery

FRANCIS SHAW AND COMPANY LIMITED MANCHESTER 11 ENGLAND

Enquiries to —

FRANCIS SHAW (CANADA) LTD GRAHAM'S LANE BURLINGTON ONTARIO CANADA

TELEPHONE NELSON 4-2350 TELEGRAMS CALENDER BURLINGTON ONTARIO

486/A

THIS HANDY BRICK DOES THE TRICK

Rubber Chemicals Division
PMC Department
HERCULES POWDER COMPANY
INCORPORATED
918 Market St., Wilmington 99, Del.

Weighing only 2½ pounds, a brick of Hercules® Defoamer 4 can make up to 40 gallons of highly effective foam control solution. It can be applied at any stages during removal of unreacted butadiene, and in the stripping column for recovery of styrene—wherever foam occurs in GR-S manufacture.

The convenience of the brick form means no waste, no mess, and no heavy drums to handle or ship. We will be glad to send you a sample brick for evaluation under your own production conditions.

HEADQUARTERS FOR HYDROPEROXIDES AND EMULSIFIERS FOR POLYMERIZATION PR55-1

How long did it take...
to get from here...to here?

Answer: 27 years

Before electric headlights were introduced in 1913, night driving by feeble, undependable light was a hazardous venture. Further research led to the development of today's high-performance sealed beam lights which became standard equipment on 1940 cars.

At the same time, the rubber industry was developing new and better ways to make rubber work harder. Partner in this development is Monsanto with its group of high-performance rubber chemicals which have done—and are still doing—so much to improve tires and other rubber products.

For example, Monsanto Santocure was the original commercially produced sulfenamide type accelerator and with Santocure NS is considered a standard of the rubber industry. Santocure NS has similar behavior in compounded rubbers as Santocure, and is characterized by excellent delayed action which gives greater freedom from scorch. The amount of Santocure NS can generally be reduced about 10% because of its greater strength.

Write today, for your copy of catalog "Chemicals for the Rubber Industry," to MONSANTO CHEMICAL COMPANY, Rubber Chemicals Dept., 920 Brown Street, Akron 11, Ohio.

MONSANTO
CHEMICALS – PLASTICS

SERVING INDUSTRY ... WHICH SERVES MANKIND

MONSANTO CHEMICALS FOR THE RUBBER INDUSTRY

ANTIOXIDANTS
Flectol* H
Santoflex* DD
Santoflex 75
Santoflex AW
Santowhite* Crystals
Santowhite MK
Santowhite L
Santowhite Powder

MERCAPTO ACCELERATORS
Santocure* NS
Santocure
El-Sixty*
Mertax (Purified Thiotax)
Thiotax* (2-Mercapto-benzothiazole)
Thiofide* (2,2'-dithiobis (benzothiazole))
Thiofide S (Seed Form)

ALDEHYDE AMINE ACCELERATORS
A-32
A-100

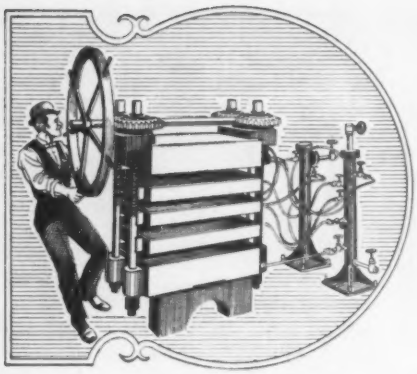
SPECIAL MATERIALS
Thiocarbanilide ("A-1")
Santovar*-A
Sulfasan* R
Insoluble Sulfur "60"

ULTRA ACCELERATORS FOR LATEX, ETC.
R-2 Crystals
RZ-50-A
RZ-50-B
Thiurad* (Tetramethyl-thiuram-disulfide)
Mono Thiurad (Tetramethyl-thiuram-monosulfide)
Ethyl Thiurad (Tetraethyl-thiuram-disulfide)

GUANIDINE ACCELERATORS
Diphenylguanidine (D.P.G.)
Guantal*

COLORS

REODORANTS



In the good old days

when grandpa molded on this screw-operated press . . .

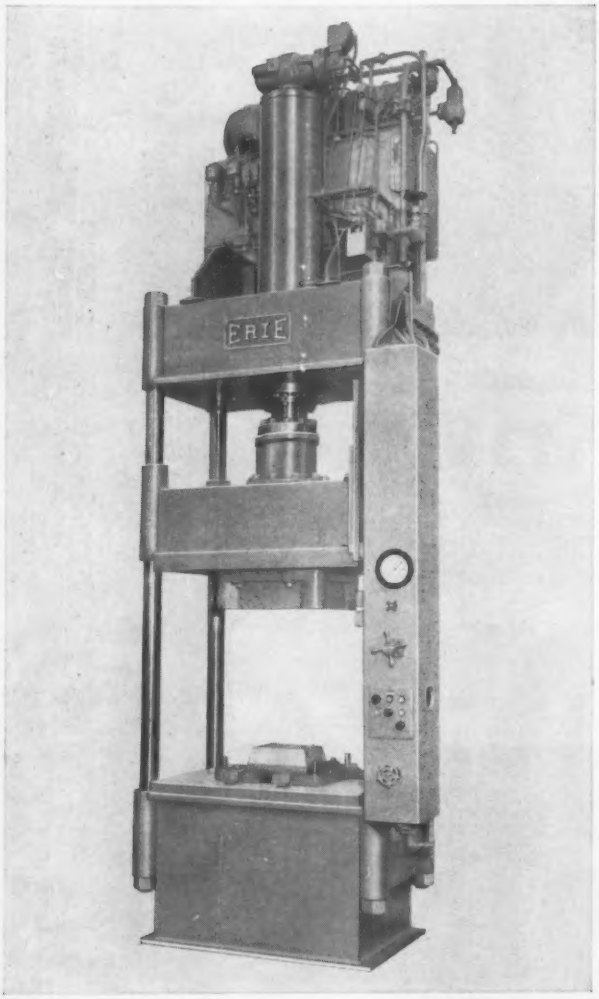
when the first physical properties tests were

used on vulcanized rubber . . . when one of the big names in the rubber

industry was Goodrich-Tew & Company . . .

when the first bicycle tires were rubber hose fastened on rims . . .

ERIE FOUNDRY COMPANY WAS A GREAT NAME IN HYDRAULIC PRESSES



in today's rubber shop

. . . when fiberglass presses are supplied with either top or bottom rams

. . . when exacting requirements of fiberglass molding require adjustable speeds and tonnages . . .

. . . when regulated stripping strokes ease removal of molded parts . . .

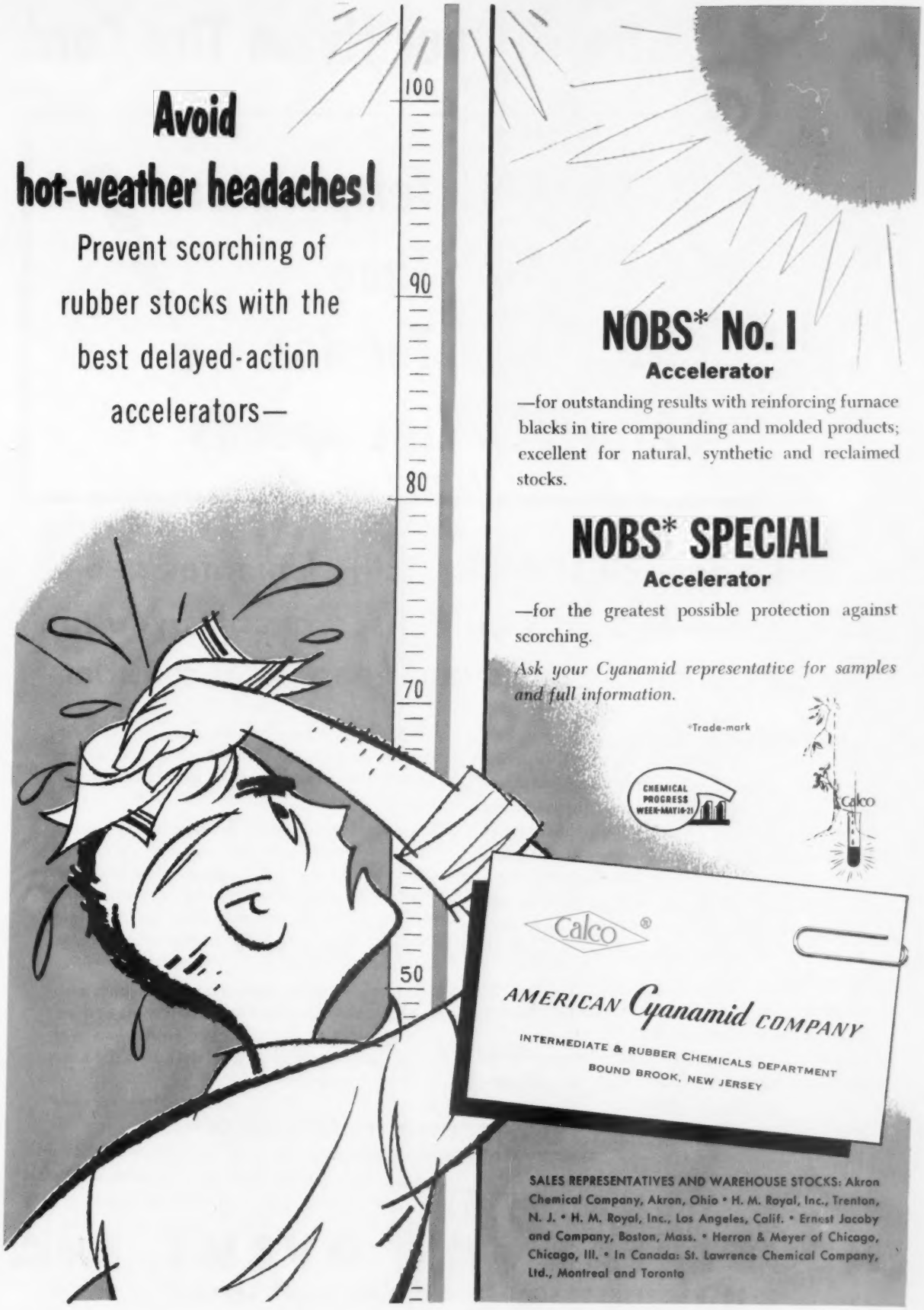
ERIE

is the greatest name in specialized hydraulic presses

ERIE FOUNDRY CO. ERIE, PA.

Avoid hot-weather headaches!

Prevent scorching of rubber stocks with the best delayed-action accelerators—



NOBS* No. 1
Accelerator

—for outstanding results with reinforcing furnace blacks in tire compounding and molded products; excellent for natural, synthetic and reclaimed stocks.

NOBS* SPECIAL
Accelerator

—for the greatest possible protection against scorching.

Ask your Cyanamid representative for samples and full information.

*Trade-mark

CHEMICAL PROGRESS WEEK-MAY 16-21

Calco®

AMERICAN Cyanamid COMPANY

INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • H. M. Royal, Inc., Trenton, N. J. • H. M. Royal, Inc., Los Angeles, Calif. • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

Now! Hot Stretch your Nylon Tire Cord

at

CONSTANT *Temperature*
CONSTANT *Time*
CONSTANT *Tension*
VARIABLE *Line speeds*

IOI's new ROLLEVATOR OVEN* *eliminates need of continually balancing 3-T's... enables you to set for optimum results and keep them constant*

THE ROLLEVATOR OVEN is an achievement accomplished by IOI as the result of more than four years of engineering and construction of full width, high tension equipment for dipping and hot stretching nylon fabric. It takes the 3 T's out of the category of variables and makes them constants. No longer must the 3 T's be continually balanced. Now you can hot stretch nylon at *constant* temperature, *constant* time and *constant* tension at *any* line speed.

Fast or slow, start-up or shutdown, the oven temperature is always the same—no more costly cold-air purges for shutdowns—no more elaborate control equipment—no reason for varying the oven temperature. There is but one temperature that is best for stretching nylon fabric and the Rollevator Oven enables you to set for that temperature and forget about it from that point on!

What about time? With temperature constant, hot stretch exposure time can not vary with line speed. The unique design of the Rollevator Oven automatically insures that each and every yard of fabric is hot stretched for the same length of time at the optimum temperature, at any line speed.

Tension, the third vital quality factor, is also held constant in this Industrial Ovens system. More closely so and at higher limits than ever before, because of improved design in the hold back and pull roll stands.

*Trade Mark

*Patent applied for.

Get the full story on this completely new Rollevator Oven system. Write, wire or phone:

INDUSTRIAL OVENS, INC.

IOI ENGINEERING VERSATILITY

13803 TRISKETT ROAD CLEVELAND 11, OHIO

We're moving

headquarters to the...

CHANIN BUILDING
122 EAST 42ND STREET
NEW YORK 17, N. Y.

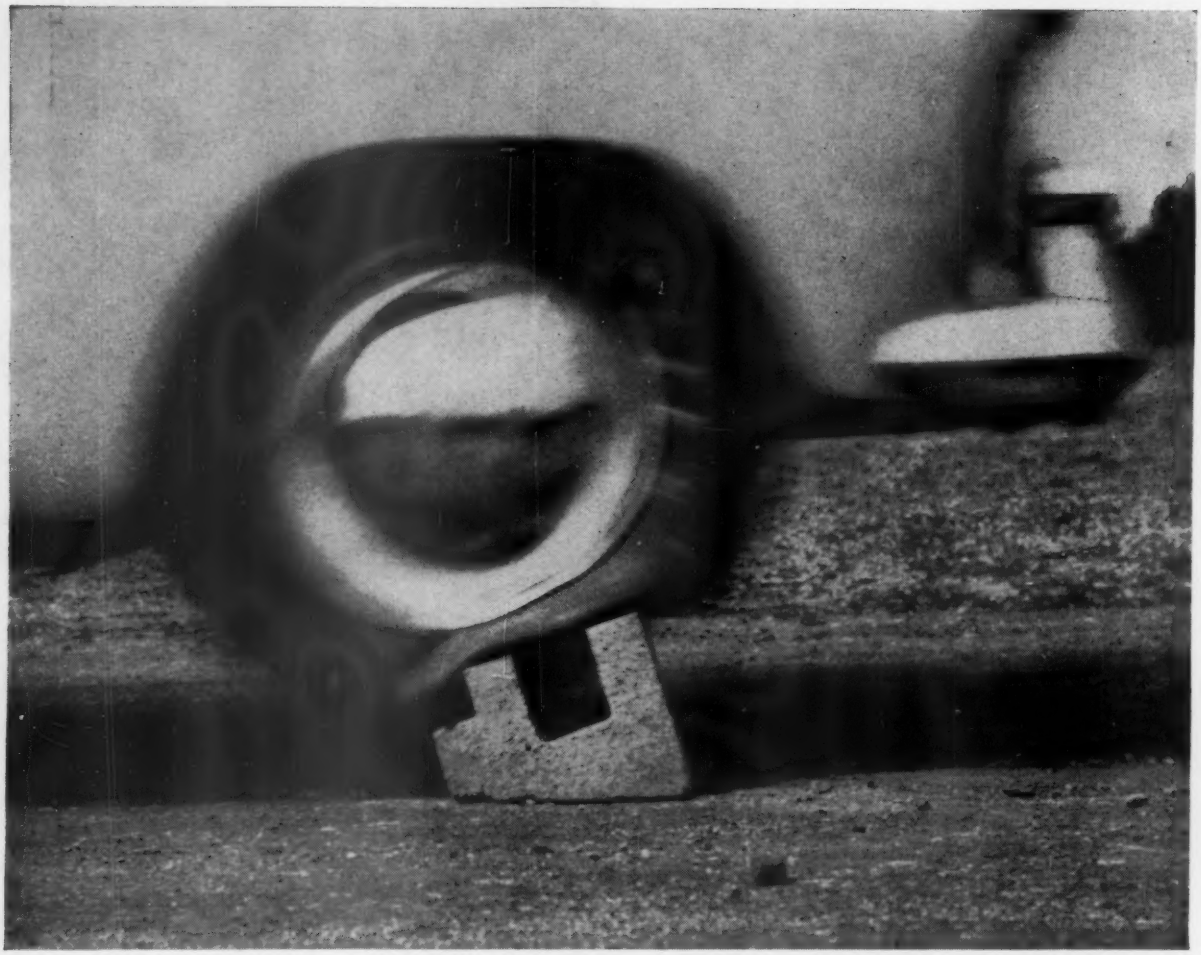
The 22nd floor is the new location of our New York sales and executive offices. And it's *your* new headquarters for dependable sales and service on quality WITCO chemicals.

WITCO CHEMICAL COMPANY

WITCO

35 Years of Growth

Chicago • Boston • Cleveland • Akron • Atlanta • Houston • Los Angeles • San Francisco
London and Manchester, England



CIRCOSOL-2XH GIVES YOUR TIRES THE EXTRA SAFETY CUSTOMERS WANT

Circosol-2XH is the elasticator that gives you the tougher, more resilient rubber needed to make safer tires. And it does it without jacking costs sky high. Enough Circosol-2XH for an 8.00 x 15 size 100 level tire costs less than 2¢ more than the cheapest softener you can buy.

Tires made with Circosol-2XH have greater resistance to abrasion, and can take impacts and a rougher all around beating than tires made with cheap softeners. Circosol-2XH helps inhibit the spread of cuts and helps tires go through hard driving on hot summer roads without damaging heat build-up.

You can get the full story on the advantages of Circosol-2XH from your local Sun Oil Company Representative—or write Dept. RA-5.

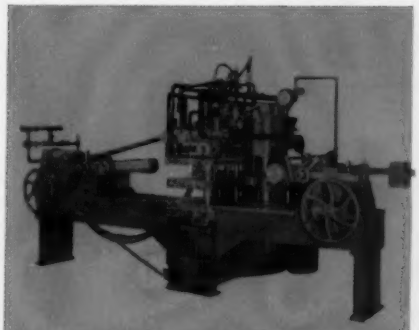
INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

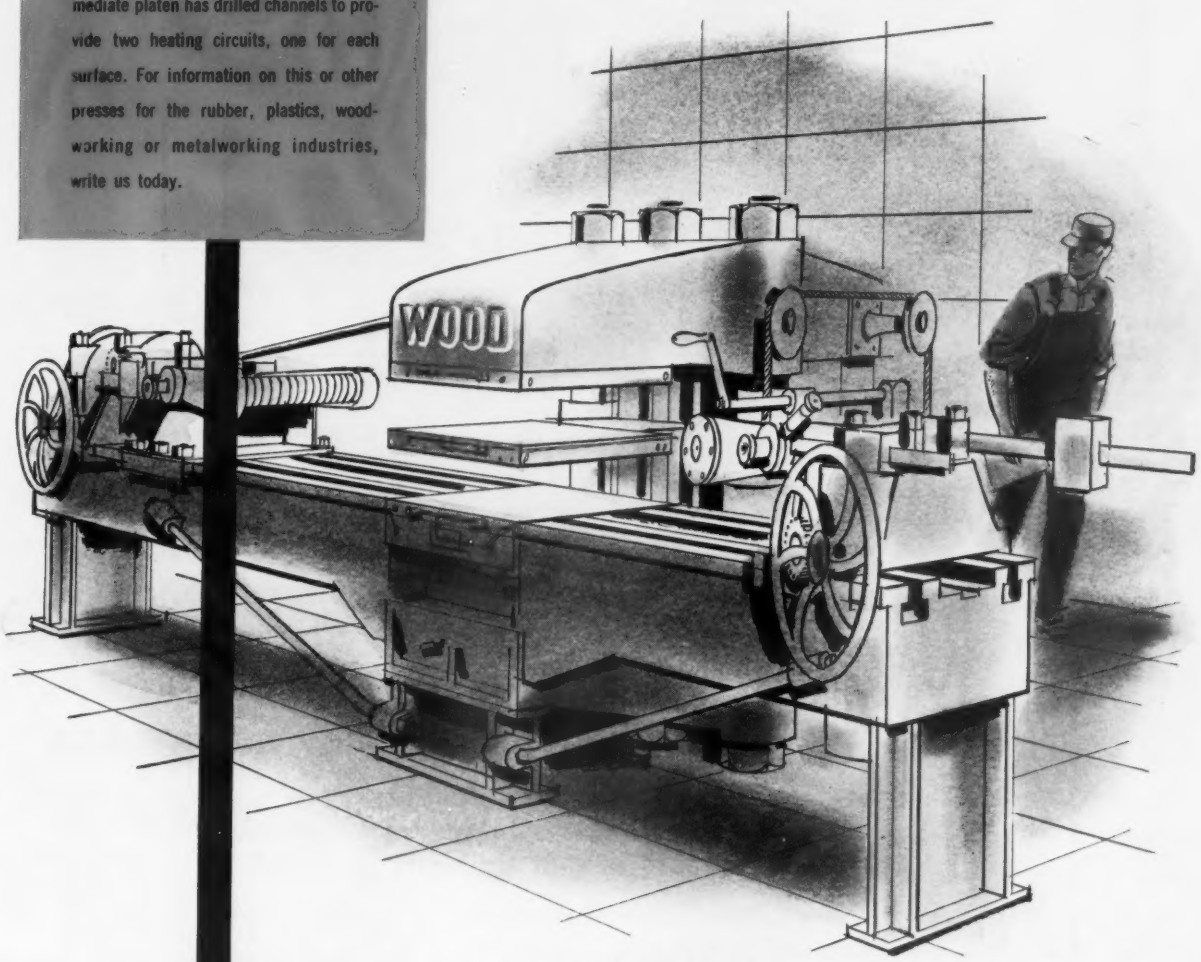
Refiners of famous High-Test Blue Sunoco Gasoline



Open Gap 47-Ton Belt Press for curing flat and V-type transmission belts. The moving platen is accurately machined from a rolled steel slab and is guided by long, full-round babbitted guides on the strain rods. Intermediate platen has drilled channels to provide two heating circuits, one for each surface. For information on this or other presses for the rubber, plastics, woodworking or metalworking industries, write us today.

Prelude to low-cost production

When an R. D. Wood press swings into action, gratifying things happen to production costs. For, in most cases, production climbs to a new high and down-time for repairs approaches zero. The reason is the smooth, dependable performance of R. D. Wood presses—even under difficult conditions. And the reasons for this superior performance are the exacting standards set by R. D. Wood—in design, selection of materials, and craftsmanship. If your company's theme is low-cost production, here is your prelude—ready made.

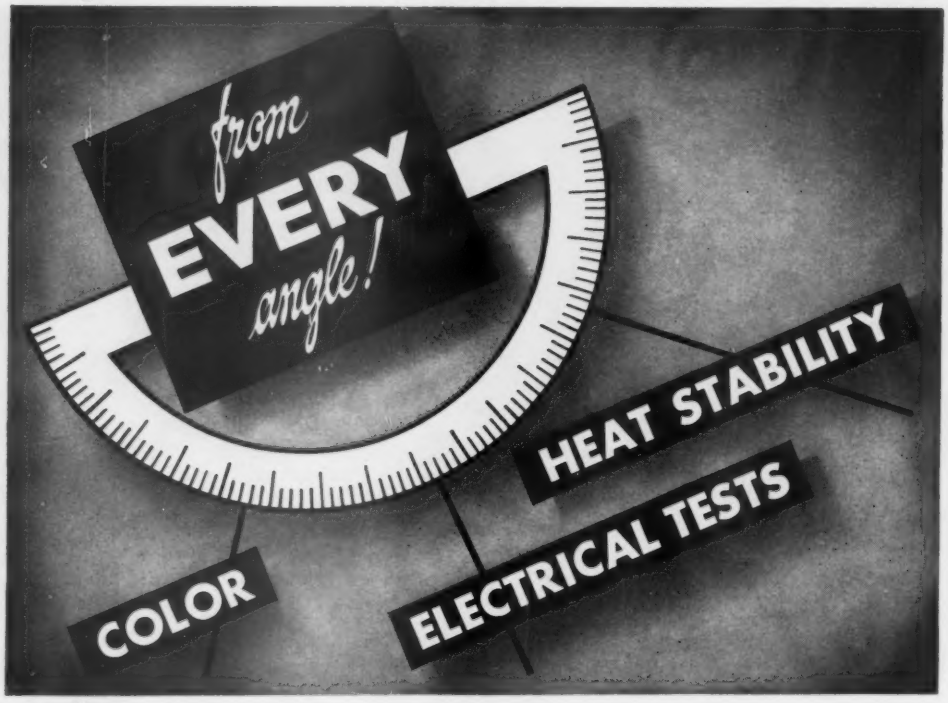


R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Representatives in Principal Cities

MAKERS OF HYDRAULIC PRESSES AND VALVES • FIRE HYDRANTS • CAST-IRON PIPE • GATE VALVES • GAS PRODUCERS • ACCUMULATORS



PIGMENT NO. 33

for Compounding

VINYLS AND SYNTHETIC RUBBER

Sample and technical data sent promptly on request

SOUTHERN CLAYS, Inc.

33 RECTOR STREET
NEW YORK 6, N. Y.

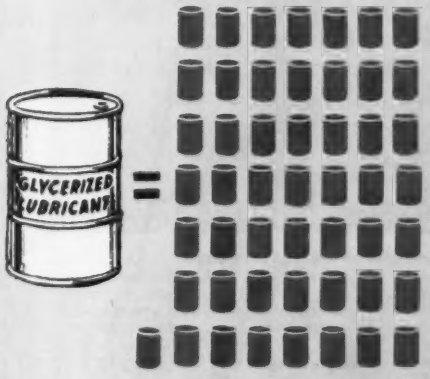
NO PUZZLE!

when you use GLYCERIZED (LIQUID CONCENTRATE) LUBRICANT

ECONOMICAL? *Here's Why...*

HIGHLY CONCENTRATED

1 drum makes up to 50 drums of working solution



Also Mfgrs. of

RUBBEROL AND SYNTHOL

TWO OTHER FACTORY PROVED RUBBER PROCESSING AGENTS

THE ALL PURPOSE EXTERNAL LUBRICANT

NATURAL SYNTHETIC AND RECLAIM STOCKS

DOES NOT INTERFERE WITH TACK OR KNIT

Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks.

QUALITY SINCE 1884

GENSEKE BROTHERS

RUBBER MATERIALS DIVISION

West 48th Place and Whipple Street **Chicago 32, U.S.A.**

STOP AND GO, SHORT HAULS WITH HEAVY LOADS, ONE TRACTOR PICKS UP 8 TO 10 TRAILERS A DAY.

"On short hauls with heavy loads, **RAYON CORD TIRES** pay off!"

—says Richard Hermann, General Manager
Hermann Forwarding Co., New Brunswick, N. J.

"Ours is the toughest kind of trucking there is . . . stop and go, short hauls with heavy loads—up to 40,000 pounds—in-city driving and on back roads. All this adds up to extra punishment on tires. That's why we use RAYON CORD TIRES exclusively. They can take it!"

READY FOR A FOURTH RECAP. "The strength of Rayon cord makes it possible for us to get more recaps per tire. That's important to us for extra mileage and economy. We usually figure on three recaps and sometimes four. This means some 160,000 miles per tire. That's where RAYON CORD TIRES pay off!"

PRE-TRIP PRESSURE CHECK. "Because of Rayon cord's strength and our policy of strict tire inspection, we are able to keep tire failure at a minimum. Last year our down-time averaged 10 to 12 hours a month—a pretty small figure when you consider that we rolled up 1,750,000 miles in 1954."

CHECKING SPARE TIRE INVENTORY. Richard Hermann, General Manager, left, looks over one of the spares with his Fleet Maintenance Superintendent. "Because of Rayon cord's dependability, we can keep our spare tire inventory down to a low 5%. We usually keep 20 new tires and 20 recaps on hand as spares."

Truckers say that tires made of Rayon cord are better for any and all kinds of trucking. Records show that more truckers use RAYON CORD TIRES than any other. They can rely on Rayon because Rayon pays off!

AMERICAN RAYON INSTITUTE
New York 1, N.Y.

Everybody's changing to DOW CORNING 36 EMULSION

Moe Muscles used to claim that with Dow Corning mold lubricants he could meet the production quota standing on his head. After trying new *fine particle* Dow Corning 36 Emulsion, however, he's willing to go one better.

That's because Dow Corning 36 has an average particle size of less than 0.5 microns or about 1/10 that of previous silicone emulsions. That means it's more resistant to creaming or separation due to heat, cold, centrifuging or high dilution than any other silicone emulsion ever developed. Equally important, in many applications fine particle size also results in a further improvement in surface finish.

Furthermore, new *fine particle* Dow Corning 36 Emulsion is available at the same low price as the regular Dow Corning mold release emulsions. That adds up to easier release, better appearance and fewer rejects . . . at production costs that are lower than you ever experienced before. For further information and a generous free trial sample, return the coupon TODAY!

first in silicones

DOW CORNING CORPORATION
MIDLAND MICHIGAN

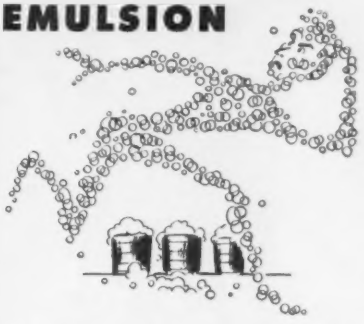
DOW CORNING SILICONES

ATLANTA CHICAGO CLEVELAND DALLAS DETROIT LOS ANGELES NEW YORK WASHINGTON, D.C. (SILVER SPRING, MD.)

CANADA: DOW CORNING SILICONES LTD., TORONTO GREAT BRITAIN: MIDLAND SILICONES LTD., LONDON FRANCE: ST. GOBAIN, PARIS

FOAM'S a FUGITIVE

from DOW CORNING ANTIFOAM AF EMULSION



Given a chance, a Dow Corning silicone defoamer almost always gets its man . . . restores productive capacity previously wasted on foam . . . reduces processing time . . . eliminates hazardous boil-overs . . . and at very low cost. For example:

- ***20 ppm defoam butadiene styrene emulsion***
- ***12 ppm defoam Geon latex***
- ***1 ppm defoam neoprene latex***
- ***22 ppm defoam soapy latex dip***

The more easily dispersed Antifoam AF Emulsion and its parent product, Antifoam A Compound, are physiologically harmless. Effective at low concentrations against the widest variety of foamers, they pay for themselves many times over.

mail coupon TODAY for **free sample**

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Mich., Dept. 9205

Please send me free sample of:

☐ Dow Corning 36 Emulsion
☐ Dow Corning Antifoam A Compound
or ☐ Dow Corning Antifoam AF Emulsion

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

Indonex
PLASTICIZERS

UNEXCELLED • ALL-PURPOSE
PLASTICIZERS
PROCESSING AIDS
EXTENDERS

FOR

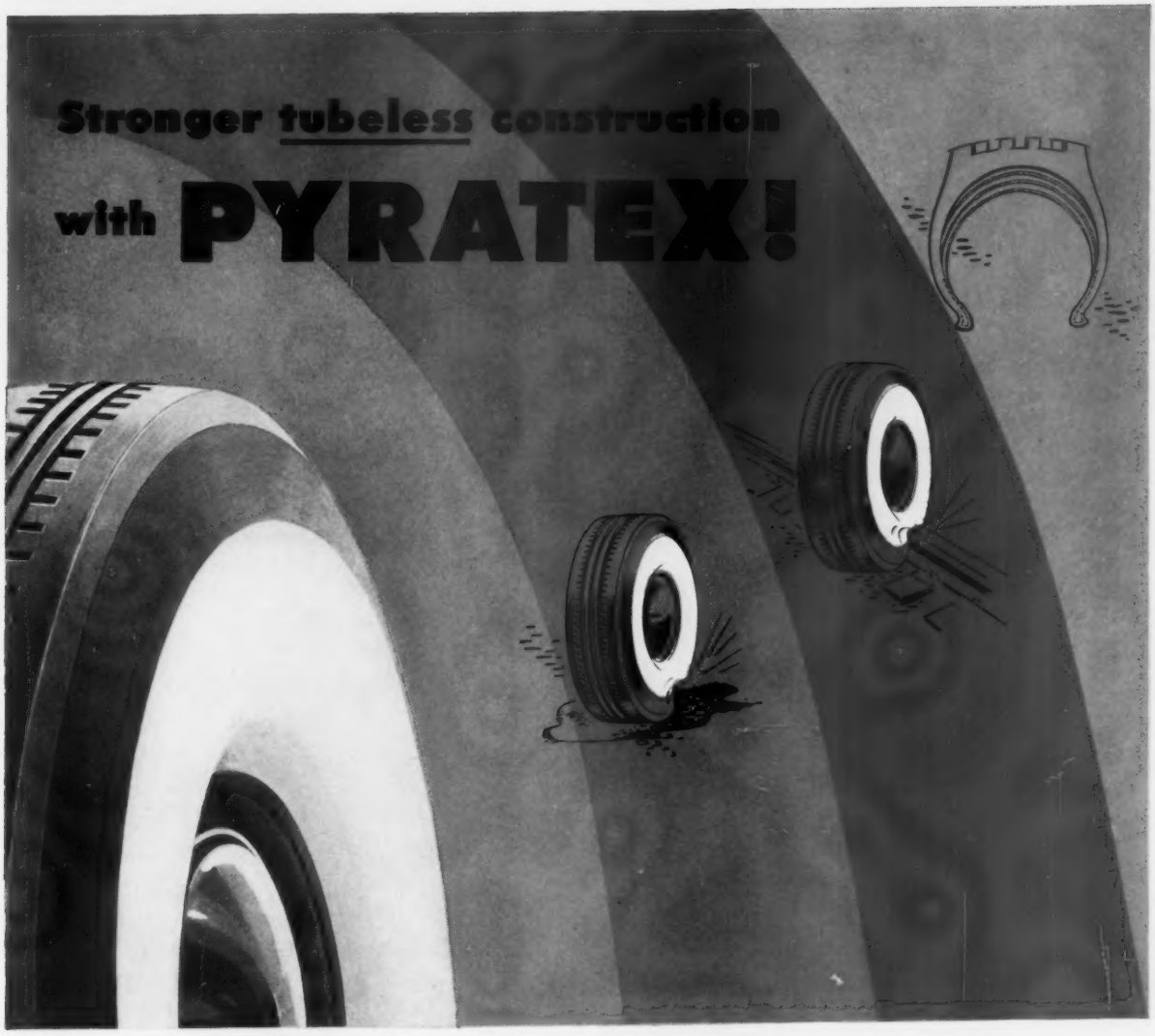
GR-S NEOPRENE BUTYL
NATURAL RECLAIM

Send for
INDONEX Plasticizer
Bulletin 13

INDOIL®
CHEMICAL PRODUCTS

INDOIL CHEMICAL COMPANY
910 South Michigan Avenue
Chicago 80, Illinois

-CH-641



PYRATEX INCREASES CORD-TO-RUBBER BOND UP TO 50%... strengthens tires against impact, and ply separation... helps make possible the popular new tubeless tires. Specifically developed to increase adhesion between rayon or nylon cord and rubber, Pyratex provides greater carcass strength.

A vinyl pyridine latex developed by Naugatuck, Pyratex will increase fatigue resistance and reduce ply separation in *all* reinforced rubber products. For superior performance in *your* automobile, bus, truck or airplane tires, V-belts, conveyor belts, or any other reinforced rubber product, *try Pyratex.* It is available for further compounding, or as a Lotol®, custom-compounded and ready for use.

For more information about how Pyratex can help improve *your* reinforced rubber products, write to us on your company letterhead, today.

PYRATEX...

- secures cord to rubber with a grip stronger than the stock itself
- keeps its outstanding adhesion under high-speed flexing and heat
- develops its adhesion more rapidly with cure
- greatly reduces "curing blows"
- has a higher solid content, for more convenient use

Naugatuck Chemical

Division of United States Rubber Company
Naugatuck, Connecticut

BRANCHES: Akron • Boston • Charlotte • Chicago • Los Angeles • Memphis • New York • Philadelphia • **IN CANADA:** Naugatuck Chemicals, Elmira, Ontario
Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices • Cable Address: Rubexport, N. Y.

"I shot an arrow into the air,
It fell to earth, I know not where."

The Arrow and the Song—Longfellow, 1845

Longfellow a space buyer?

Longfellow's lament could well have been applied to advertising back in 1845. Yes, even up to 1914 when a group of advertisers, agencies and publishers, alarmed by the waste and guesswork in their business, brought order out of advertising chaos by organizing the Audit Bureau of Circulations. These pioneers in circulation auditing established a definition for paid circulation, rules and standards for measuring circulation, methods for auditing and reporting the FACTS. *For value-minded advertisers the era of blind space buying ended in 1914.* ☆ ☆ Today's experienced space buyers use the audited information in A.B.C. reports to aid them in applying media to markets and get full value for advertising dollars. Here are some of the FACTS in A.B.C. reports that provide a sound basis for advertising investments: • How much paid circulation • How much unpaid distribution • Occupational or business breakdown of subscribers • Where they are located • How much subscribers pay • Whether or not premiums are used • How many subscribers in arrears • What percentage of subscribers renew. ☆ ☆ Sales messages go direct to their targets, there's no shooting "into the air" when space buyers base their decisions on A.B.C. FACTS. This publication is a member of the Audit Bureau of Circulations because we want our advertisers to know what they get for their money when they use space in these pages. Ask for a copy of our A.B.C. report and then study it.

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

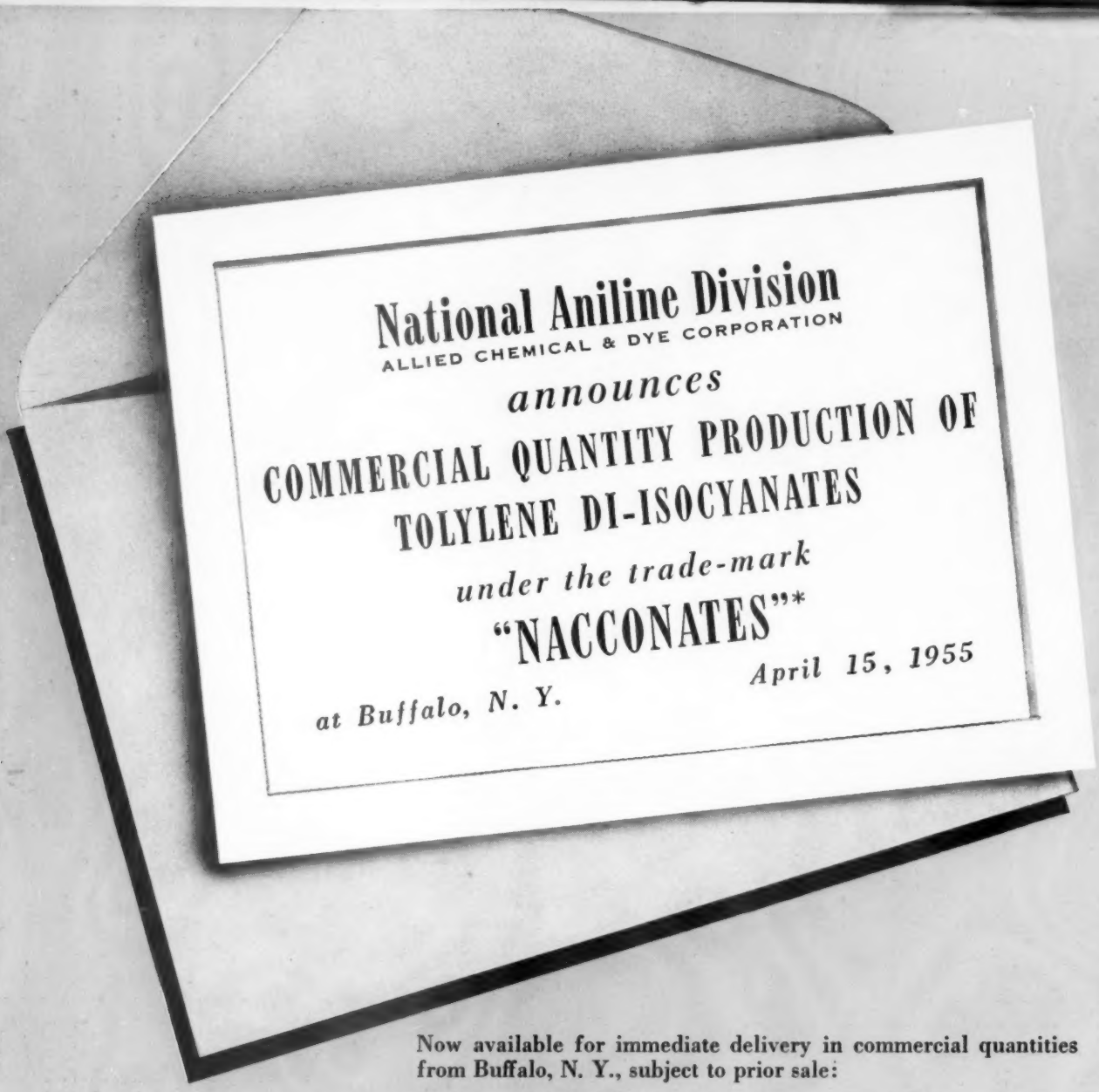
Paid subscriptions and renewals, as defined by A.B.C. standards, indicate an audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.

RUBBER AGE

101 WEST 31 STREET, N. Y. 1, N. Y.

A.B.C. REPORTS—FACTS AS A BASIC MEASURE OF ADVERTISING VALUE

Here's
ONE way
to make
CARBON BLACK
. . . a coin in the flame of a match — and you're making carbon black. But not with the controlled properties that make the big difference in your rubber compounds — particle size, conductivity, abrasion resistance, etc.
Witco-Continental operates five modern plants . . . offers a complete line of blacks with controlled properties for every rubber compounding need.
Every advance in carbon black technology is working for you at Witco-Continental. Our technical staff will be glad to assist you with your formulations.
CHANNEL BLACKS
Continental® AA — (EPC) — Witco No. 12
Continental A — (MPC) — Witco No. 1
Continental F — (HPC) — Witco No. 6
Continental R-40 — (CC) — Conducting
FURNACE BLACKS
Continex® SRF — Semi-Reinforcing
Continex SRF-NS — Non-Staining
Continex HMF — High Modulus
Continex HAF — High Abrasion
Continex FEF — Fast Extruding
Continex ISAF — Intermediate Super Abrasion
WITCO
35 Years of Growth
WITCO CHEMICAL COMPANY
CONTINENTAL CARBON COMPANY
122 East 42nd Street, New York 17, N. Y.
Chicago • Boston • Cleveland • Akron • Atlanta • Houston • Amarillo
Los Angeles • San Francisco • London and Manchester, England



National Aniline Division

ALLIED CHEMICAL & DYE CORPORATION

announces

COMMERCIAL QUANTITY PRODUCTION OF TOLYLENE DI-ISOCYANATES

under the trade-mark

"NACCONATES"*

at Buffalo, N. Y. *April 15, 1955*

Now available for immediate delivery in commercial quantities from Buffalo, N. Y., subject to prior sale:

National NACCONATE 80 Isomeric mixture of 80% 2, 4-tolylene di-isocyanate and 20% 2, 6-tolylene di-isocyanate

Also available for commercial development work:

National NACCONATE 65 Isomeric mixture of 65% 2, 4-tolylene di-isocyanate and 35% 2, 6-tolylene di-isocyanate

National NACCONATE 100 2, 4-tolylene di-isocyanate

National NACCONATE 200 3, 3′ bitolylene 4, 4′-di-isocyanate

National NACCONATE 300 Diphenylmethane 4, 4′-di-isocyanate

We invite inquiries for samples, technical data and quotations.

Watch the editorial and advertising pages of this publication for additional information on National NACCONATES

*Trade Mark

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Boston Providence Philadelphia Chicago San Francisco
Portland, Ore. Greensboro Charlotte Richmond Atlanta
Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto

X-ray "Private-eye" of quality control...

You are looking at the beginning of a quality control step that used to take over four hours—now it's done in six minutes! A specimen of Glidden Rutile Titanium Dioxide is being readied for exposure to 4 X-ray beams in the Diffractometer. The "magic eye" of this unit will determine the degree of rutilization in the pigment, then amplify, count and record the data. It's all part of the extra care that Glidden takes to assure you the highest quality pigments—Rutile and Anatase Titanium and Cadmolith Reds and Yellows. Ask now for detailed information on these products of Glidden Planned Research.

THE GLIDDEN COMPANY

Chemicals • Pigments • Metals Division

Baltimore, Maryland • Collinsville, Illinois • Hammond, Indiana • Scranton, Pa.

CHEMICALS
PIGMENTS
METALS

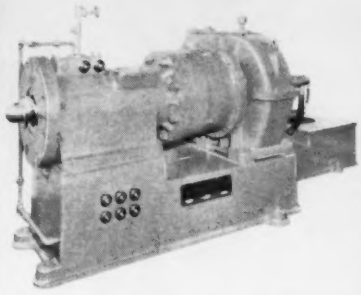
QUALITY
Glidden
PRODUCTS

RUBBER and PLASTIC *machinery*

Builders of National Erie Line

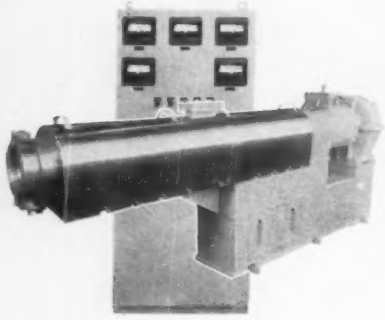
The combination of H & K and Aetna-Standard offers a complete service to the rubber and plastic industries. Builders of the National Erie line of machinery, H & K and Aetna make all types of equipment. Sales and engineering are the responsibility of Hale & Kullgren, Akron, Ohio. Aetna manufactures the equipment in their Warren, Ohio, plant.

EXTRUDERS and STRAINERS FOR RUBBER



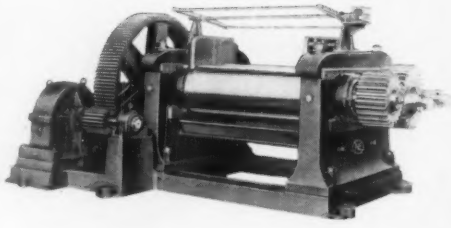
Standard sizes 2½ through 12". Illustrated—6" size for tire treads.

EXTRUDERS FOR PLASTICS



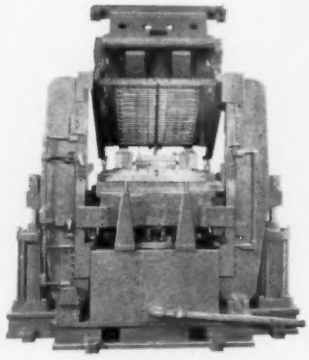
Sizes: 1½", 2½", 3½", 4½", 6", 8" and 10". Illustrated—4½" with devolatilizing section and heat control panel.

MILLS



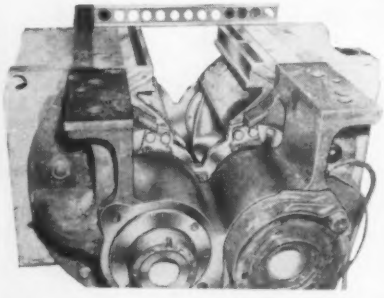
Sizes from 6" x 12" through 26" x 84". Automatic or Standard types.

PRESSES



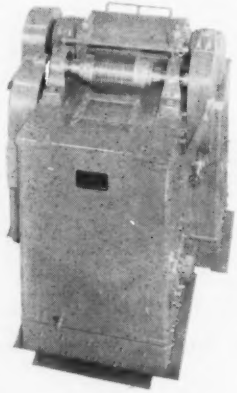
Tilting Head (illustrated); Plate Side and Rod Type with all standard platen sizes.

BANBURY REPAIR SERVICE



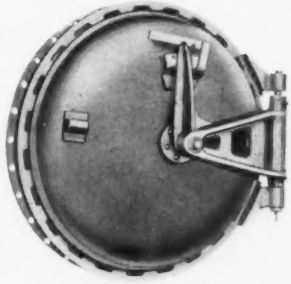
Standard Parts, Swap Service or Rebuilding Service.

CUBERS



Heavy-Duty 4-Ton, cuts one to three million pounds before resharpening.

SIMPLEX DOORS



Any size from 12 inches to 12 feet, pressures up to 400 pounds, also for vacuum. Designs for special applications.

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THE AETNA-STANDARD ENGINEERING CO., PITTSBURGH, PA.
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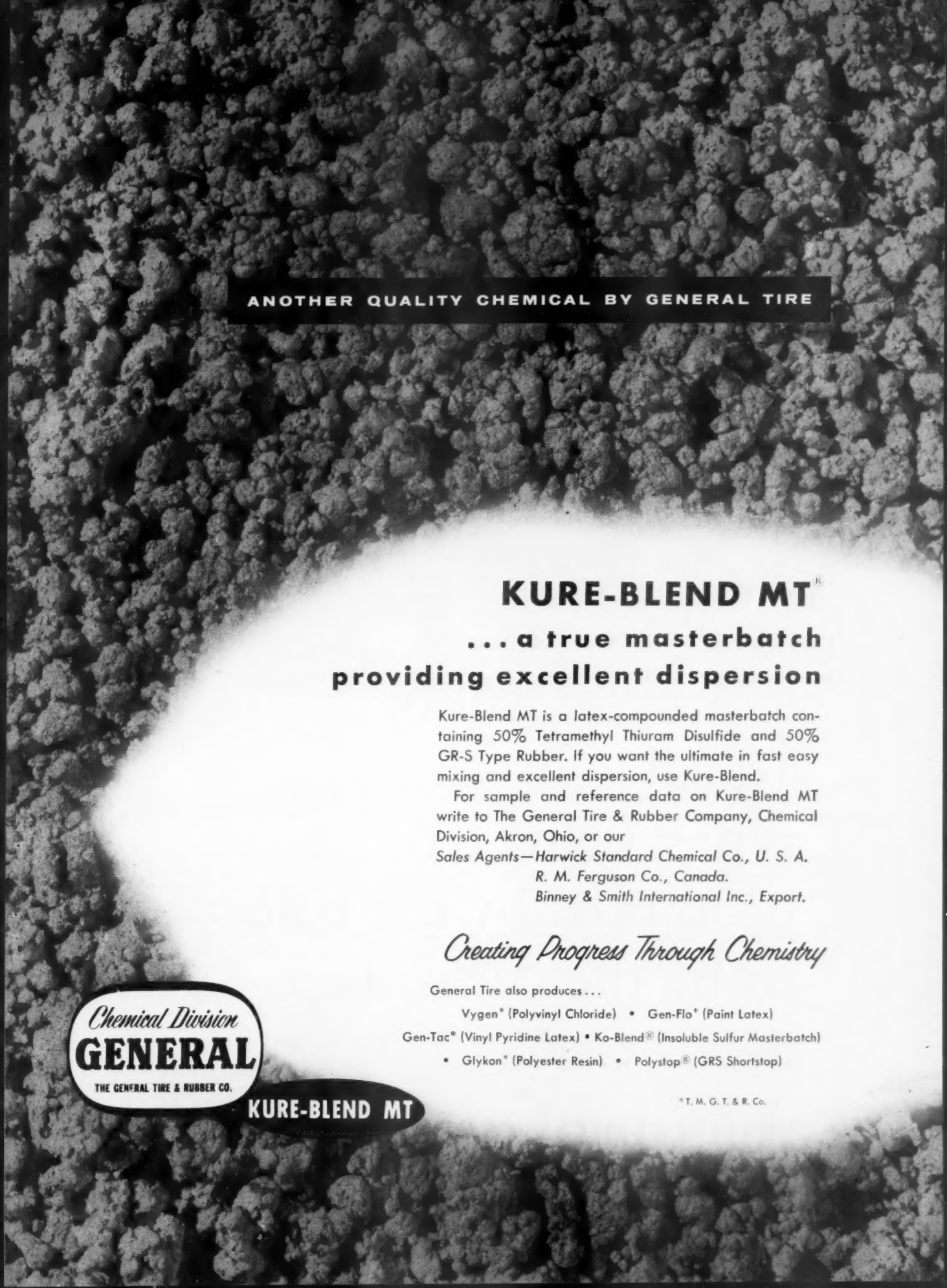
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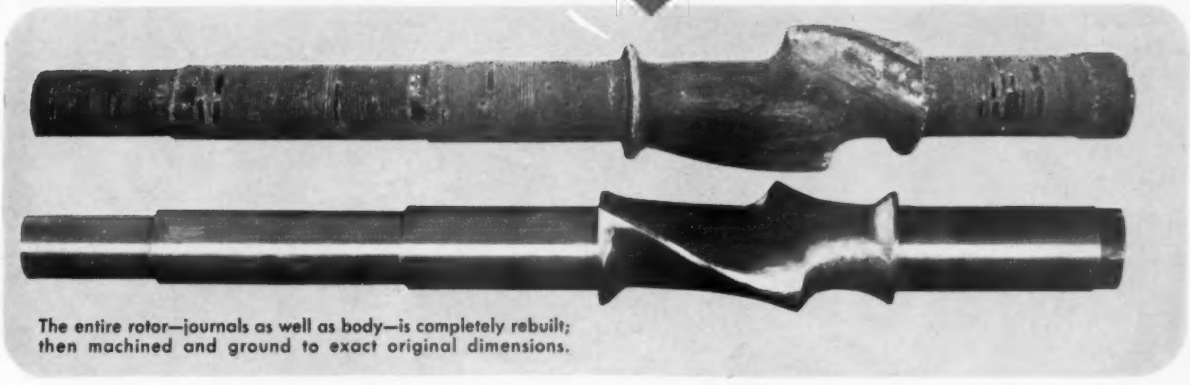
SHELL CHEMICAL CORPORATION
SYNTHETIC RUBBER SALES DIVISION

The photographs above show a Banbury rotor with extensive body wear and severe journal scoring—typical of most rotors returned to us for repair.

Only this kind of rebuilding



The entire rotor—journals as well as body—is completely rebuilt; then machined and ground to exact original dimensions.

gives you *NEW BANBURY® PERFORMANCE*

The above rotor came into the Farrel-Birmingham shop with severe pits, shaft out of alignment and scored bearing surfaces. As corrective machining would have made the rotor undersize, the body and necks were first built up to proper dimensions—but with no guesswork. The dimensions were found in the exclusive blueprints used in making the Banbury originally.

The rotor was rebuilt in a sequence of 42 separate operations, including three non-destructive tests for soundness. Result: the rebuilt rotor is exactly as good as a new one, and carries the same guarantee.

The repair and rebuilding of other parts of the Banbury mixer is handled with the same painstaking care. Farrel-Birmingham knows how to restore and often improve on the original working efficiency of each part and, in addition, has the manufacturer's special interest in maintaining the Banbury's reputation.

Next time your Banbury needs rebuilding, make sure it's the kind of rebuilding that will give you new Banbury performance – call the Farrel-Birmingham office nearest you.

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A unit load starts with a paperboard sheet. On this, bags are stacked and lightly glued together to form a compact load, easily handled by conventional fork trucks. Savings are realized in the form of increased speed and safety of unloading, as well as in the greater convenience of warehouse storage and re-handling.

Contact any sales office of Stauffer for advice and further information on unit loading to suit your particular requirements. **Stauffer Chemical Company, 380 Madison Avenue, New York 17, N. Y.; 326 South Main Street, Akron 8, Ohio; sales offices in principal cities.**

Quicker, cheaper handling

No bulky pallets to return — paperboard sheets are disposable

Safer handling • Units up to 4000 pounds

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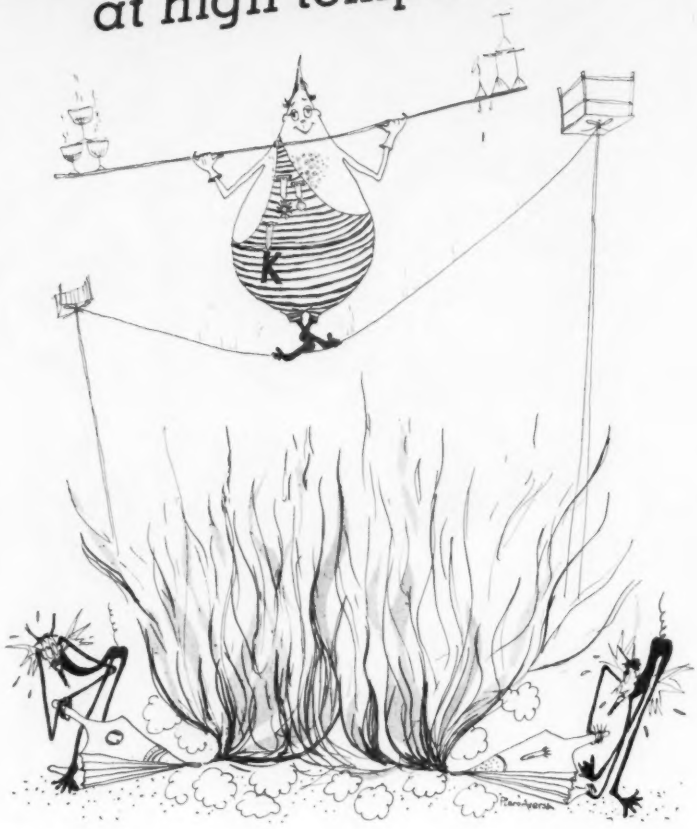
STAUFFER Stauffer CHEMICALS SINCE 1885

STABLE PERFORMANCE at high temperatures

Kenflex Resins



Kenflex resins are a series of polymers of aromatic hydrocarbons in pumpable liquid or solid form. Highly efficient as a plasticizer at compounding or processing temperatures. You can get desired results with use of smaller quantities with practically no loss of physical properties. Kenflex resins impart excellent electrical properties, have outstanding stability at high temperatures, and have good wetting properties.

Kenflex resins are useful and compatible with natural and all synthetic rubbers, vinyls, polystyrenes, and other polymers.

Kenflex resins are versatile:

- Improve heat aging of Neoprene, Butyl, Hypalon, GR-S, and Vinyl
- Outstanding processing aid for cold GR-S. Excellent aid for all other GR-S. Overcome erratic behavior in the plant and has often increased extrusion rate
- No effect on Butyl cure
- Markedly improve ozone resistance in Butyl
- Help control Neoprene scorch and bin set-up
- Excellent mold flow and mold release for high durometer compounds and hard rubbers
- Excellent plasticizer and extender for Hypalon for high temperature service
- Fast and complete fluxing of vinyls

Send for samples and literature

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Why tire molds are "finished" twice at BRIDGWATER

Here a tire mold craftsman pre-polishes a mold cavity, at Bridgwater's Athens Machine Division, Athens, Ohio. This is a "first finish" operation, performed on all Bridgwater Tire Molds after cavities are machined and before top cutting on the tread engraving machines. A second and "final finish" manufacturing phase occurs at the *end* of our mold production line, but two important purposes are served by this "first finish" operation: One, if even a *minute* flaw exists in the cavity surface, it is revealed for correction. Two, pre-polishing helps obtain critical fitting between cavity surface and template, assuring perfect adherence of form to mold design.

"First finishing" typifies the infinite care with which automotive tire molds are made at the Athens Machine Division. It is one example of the *many* precise skills and specialized machine tools — many of our own design — which combine to produce the Bridgwater Molds well known in the tire industry for their higher quality and greater workability.

Yet you pay no premium for Bridgwater Tire Molds . . . At Athens, tire molds are our only product. Here, extremely efficient machines and production methods, and experience-developed skills of metal-working craftsmen, are devoted exclusively to meeting tire industry mold requirements *quickly*, at favorable cost.

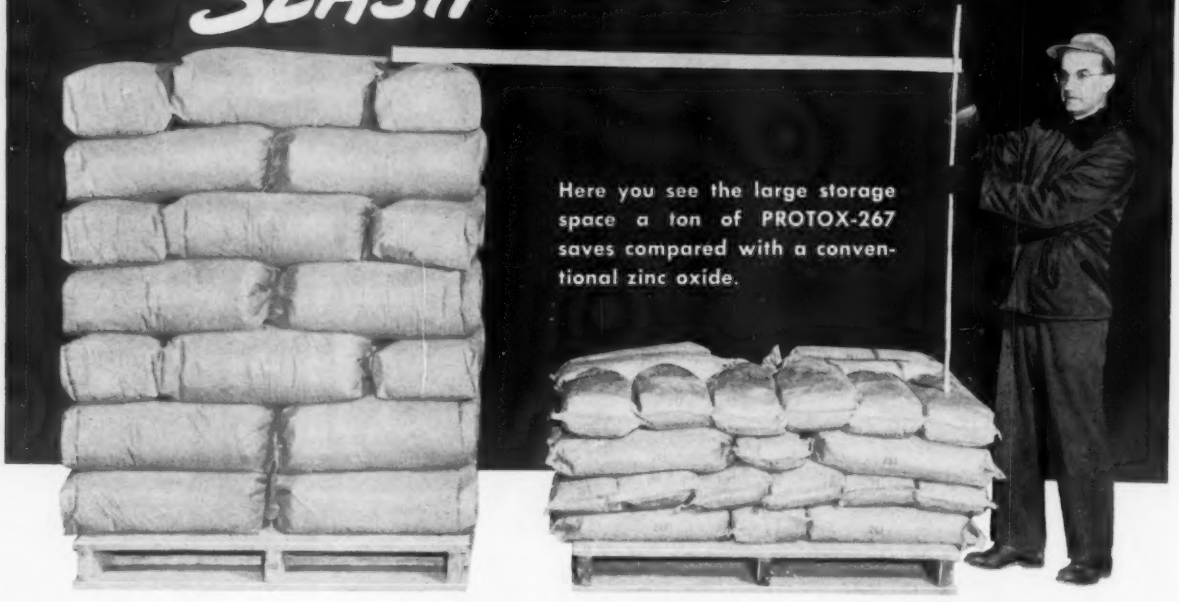
Athens Machine Division

BRIDGWATER MACHINE COMPANY

Akron, Ohio

1907

EXPAND YOUR STORAGE SPACE... SLASH STORAGE COSTS



WITH PELLETED PROTOX-267

Whether you store zinc oxide in bags or bins, you can save valuable space with PROTOX-267.*

1. SAVE ON BAG STORAGE

You can cut your oxide storage space and storage costs by as much as 67% with PROTOX-267—because that zinc oxide bulks 80 pounds per cubic foot as against 25–30 pounds for many conventional oxides.

2. SAVE ON BIN STORAGE

PROTOX-267 is a "natural" for storing in bins. Its high density saves space; its pellets, like peas on a knife-blade, have a low "angle of repose" and flow fast out of bins.

*U. S. Patents 2,303,329 and 2,303,330.

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Producers of Horse Head Zinc Pigments

... most used by rubber manufacturers since 1852

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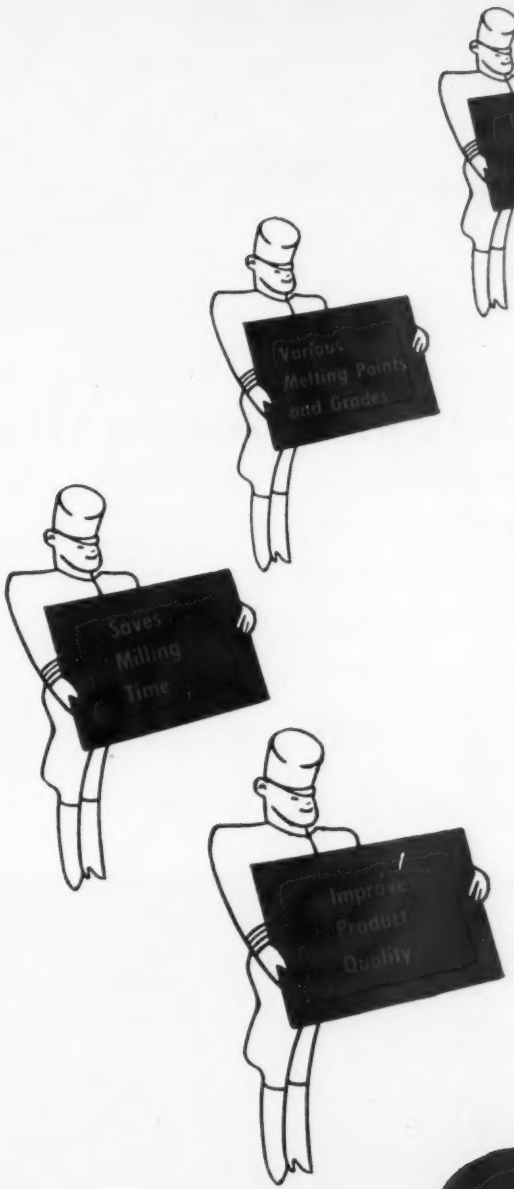
HORSE HEAD PRODUCTS

Neville Chemicals



for improving **rubber** products

Neville's years of experience with the problems of rubber manufacturers have produced a superior line of resins and oils for greater ease and uniformity in rubber processing.

Neville Coumarone Resins have long aided in processibility and pigment dispersion with improved physicals including heat stability, tensile and tear. They insure highest quality and maximum economy of production.

Let us help you select the right grade for your purpose.

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R-52

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GOODYEAR
DIVISION

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for the sale of GR-S Latices.
This association will continue to
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services General Latex has
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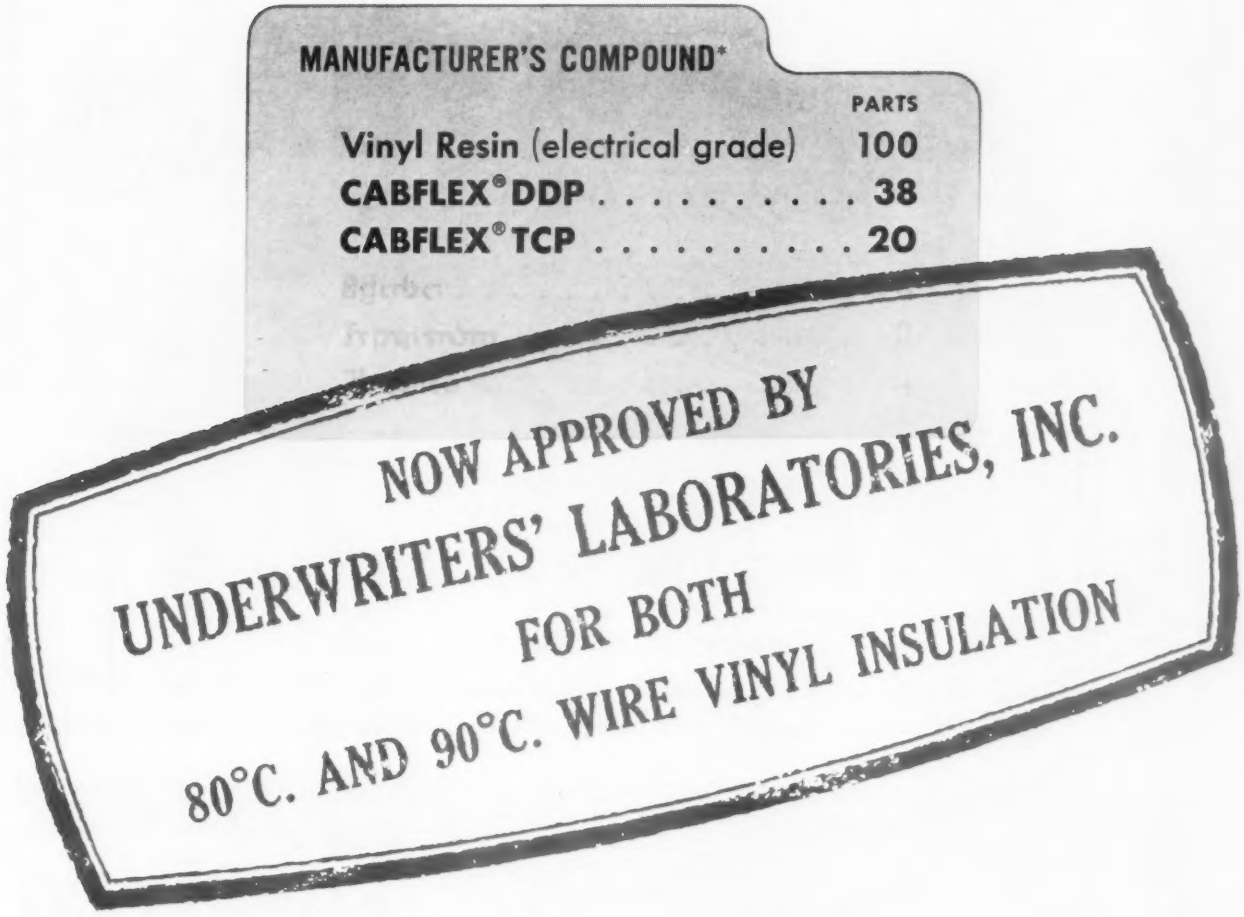
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PARTS
Vinyl Resin (electrical grade) 100
CABFLEX® DDP 38
CABFLEX® TCP 20
NOW APPROVED BY
UNDERWRITERS' LABORATORIES, INC.
FOR BOTH
80°C. AND 90°C. WIRE VINYL INSULATION

A SINGLE COMPOUND MADE WITH BOTH

CABFLEX® DDP AND NEW CABFLEX® TCP

DI-DECYL PHTHALATE — TRICRESYL PHOSPHATE

Mixed Tank Truck and Tank Car Quantities of both Cabflex® DDP and New Cabflex® TCP Immediately Available for Use in Your 80° C. and 90° C. Wire Vinyl Insulation

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CABFLEX®ODA (iso-octyl decyl adipate)
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Latex and Latex Compounds
for all purposes

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won't be sold—

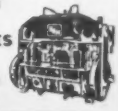
WE'RE BUILDING IT TO HELP SOLVE YOUR RUBBER EXTRUSION PROBLEMS

Special design and special construction characterize this Extruder now taking shape in our Akron plant. When completed, it goes to our laboratory where the special work it will do for rubber industry people may well prove valuable in helping to solve some of your own rubber extrusion problems.

The Extruder will incorporate, among other unique features, facilities for devolatilizing and oil injection. It can be water cooled, or heated by steam or oil. It can be converted quickly from short to long machine, either having smooth-bore cylinder, Mil-X-Truder liners, or combination of both. It can use any of several patented NRM feed screw types, and interchangeable feed boxes will provide for a variety of feeding methods. In effect, the machine will provide all extruder variations necessary for testing standard or special rubber compounds under production conditions.

If this Extruder—or our entire laboratory facilities—can help in developing and testing your compounds, or in determining the type and size of extruders you need, we invite you to call on us. Not only do we welcome being of direct service, but by working *with* you, we can be certain that NRM Rubber Extruders and Equipment are designed and constructed to assure doing your job with greatest efficiency, at least cost.

ENCOURAGE OUR YOUTH To CONSIDER The OPPORTUNITIES In ENGINEERING and SCIENCE



2393

NATIONAL RUBBER MACHINERY COMPANY

NRM

Creative Engineering

General Offices and Engineering Laboratories:
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"IT'S A *PLEASURE* WORKING WITH **DETERO WAX BEADS**"

"I like Detero Wax because—

IT POURS easily—no messy flakes—will not stick in hot weather or hot mill rooms. Handles much more easily!

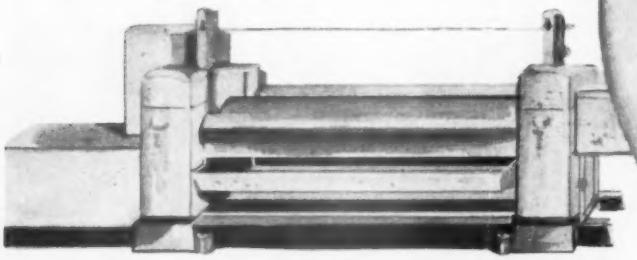
IT MEASURES so easily and quickly—no "approximate" weights!

IT DISPERSES easily and uniformly—cuts mixing time!"

A message to the man who BUYS the wax at your plant:

The man who *uses* DETERO WAX *likes* it because it makes his job easier—*but* DETERO WAX makes the product better, too.

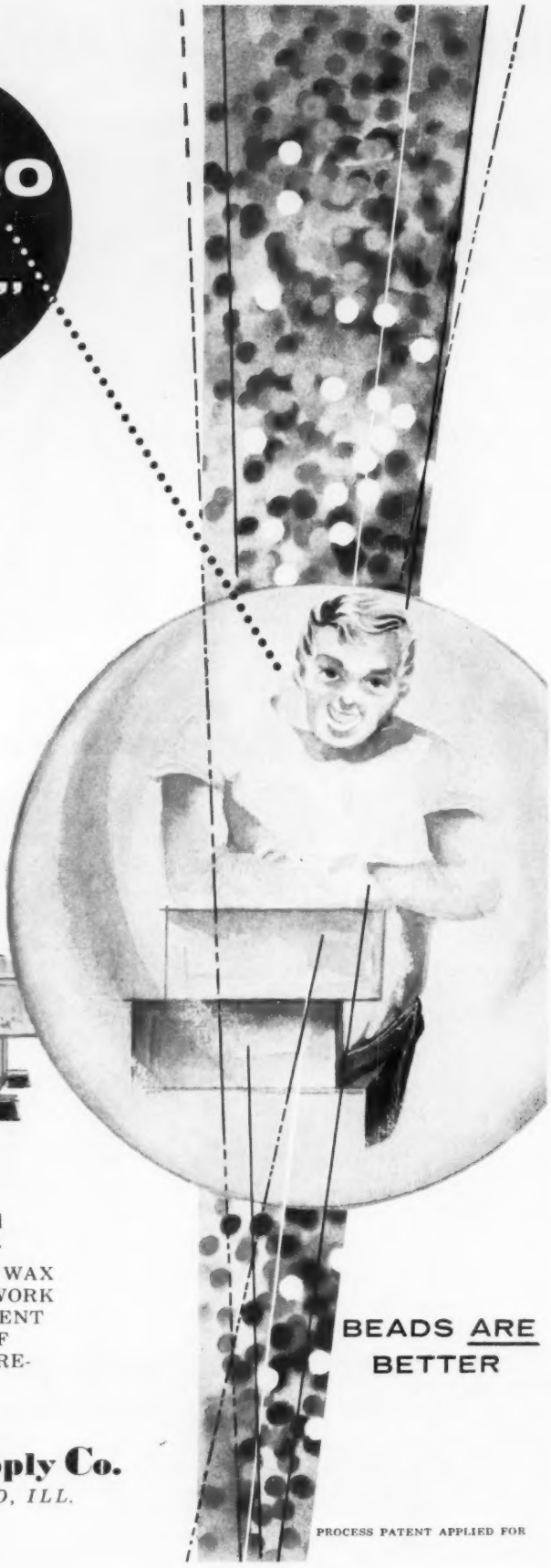
Detero Wax has been tried and tested in rubber formulations, and has been proven to give superior protection against weather and ozone.



Specific wax blends for unusual rubber formulations can be beaded according to your specifications.

Blended DETERO WAX BEADS *speed* and *improve processing* and *improve the product.*

We have also developed special DETERO WAX BEADS for VINYL PLASTICS. LET US WORK WITH YOU—TO *IMPROVE* YOUR PRESENT PRODUCTS or in the DEVELOPMENT OF NEW PRODUCTS FOR SPECIAL REQUIREMENTS OR CONDITIONS.



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PROCESS PATENT APPLIED FOR

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236 WEST NORTH AVENUE, CHICAGO, ILL.

Make your products durable-

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HYPALON®

(CHEMICAL RUBBER)

for complete resistance to OZONE attack

- No HYPALON composition has ever been observed to crack in the presence of ozone.
- No special compounding or processing techniques are required—ozone resistance is an inherent property.
- HYPALON coatings over other rubbers protect them from ozone, in bright colors, too.
- Blending HYPALON with other elastomers improves ozone resistance.
- Possible applications include white sidewalls, weather stripping, wire coverings, gaskets for ozone generators, and other products that may be exposed to ozone attack.

See Elastomers Division Report:

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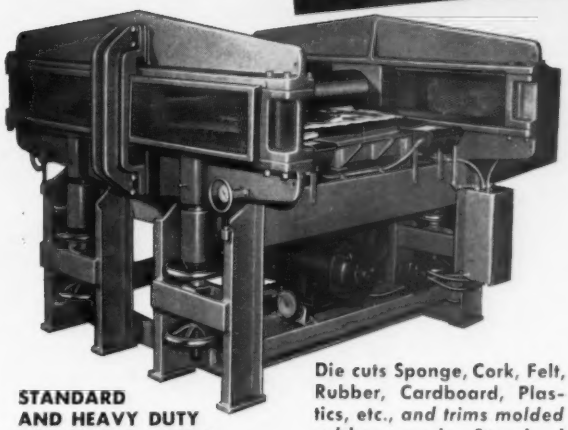
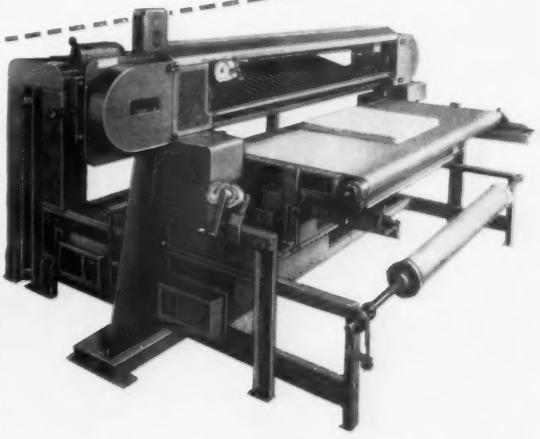


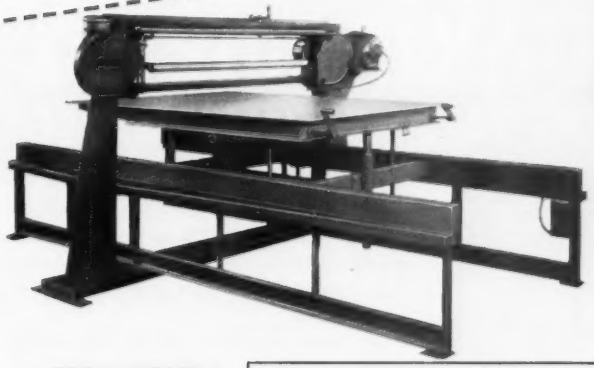
STANDARD AND HEAVY DUTY ROLLER DIE CUTTER (bed area to 24 sq. ft.)

Die cuts Sponge, Cork, Felt, Rubber, Cardboard, Plastics, etc., *and trims molded rubber goods.* Standard and Heavy Duty Models.



FOAM RUBBER SPLITTER

This is our newest Splitter, engineered especially to split synthetic materials, plastics, etc. Splits rolls, slabs, sheets to ⅛" thickness, at 9 to 26 feet per minute.



FOAM RUBBER CUSHION CUTTER

The Cushion Cutter is ideal for fabricating cushioning and seating stock, including plastic materials, also for leveling materials before splitting.

These machines will die cut or split Synthetic and Natural Foam Rubber, Latex and Bonded Foam, Rubberized Hair, Cellulose Sponge, Cork, Resin Bonded Fiber, Wood Fiber, Fiberglass and Plastics in rolls, slabs and sheets.

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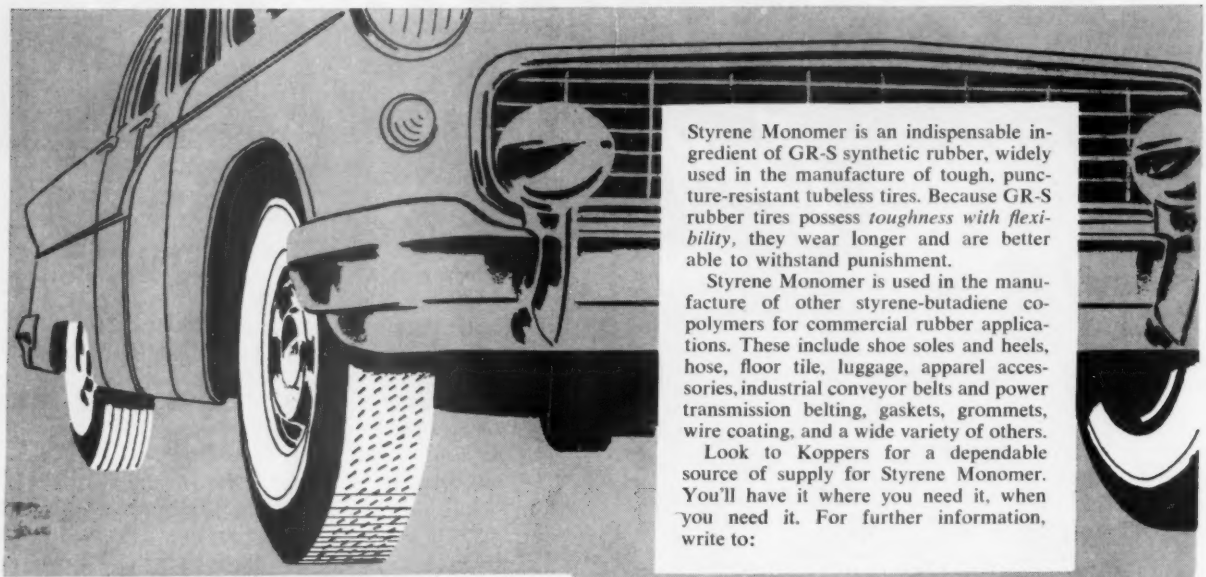

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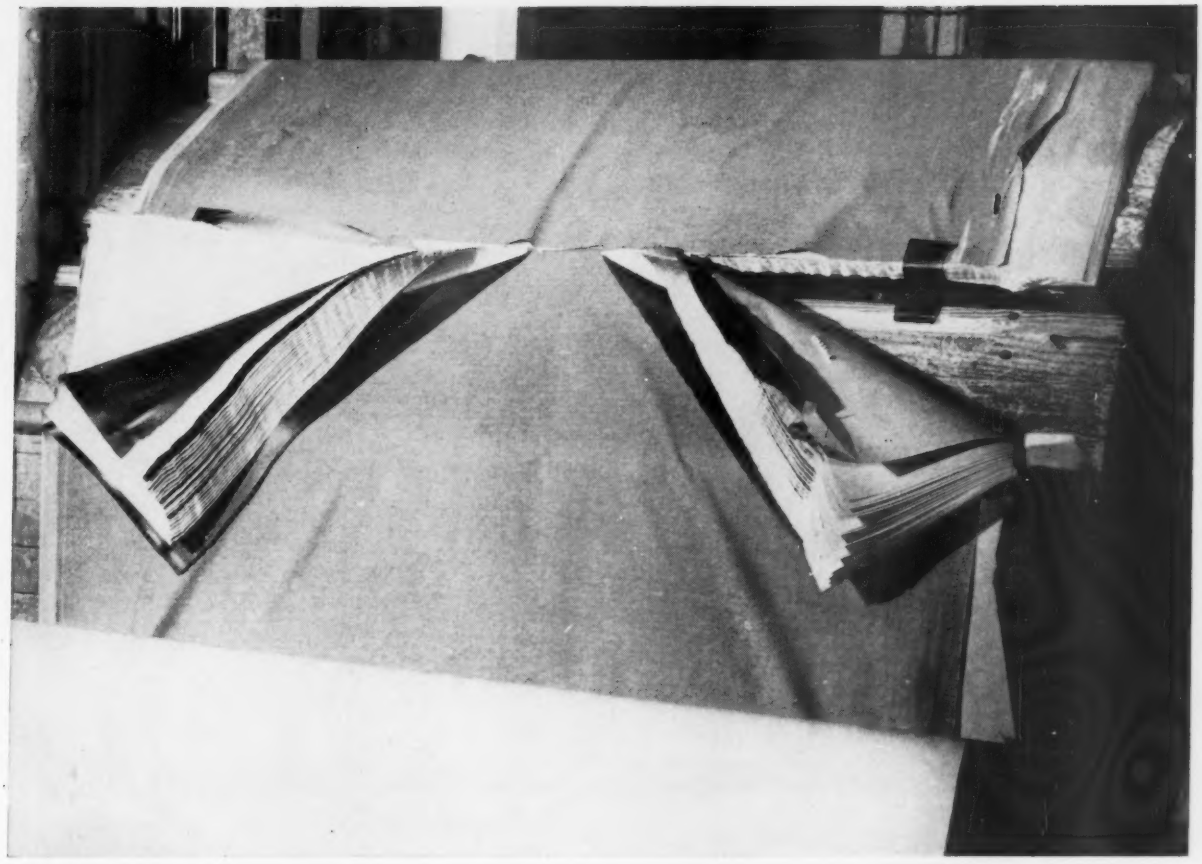

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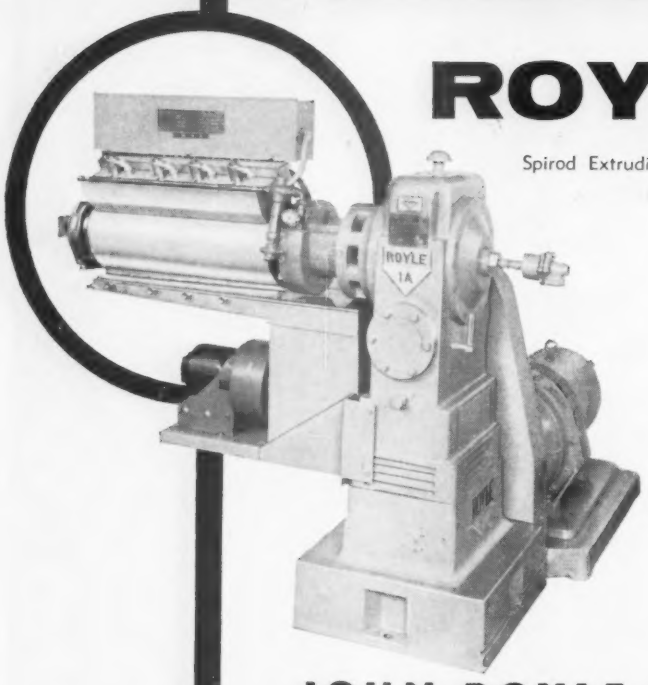

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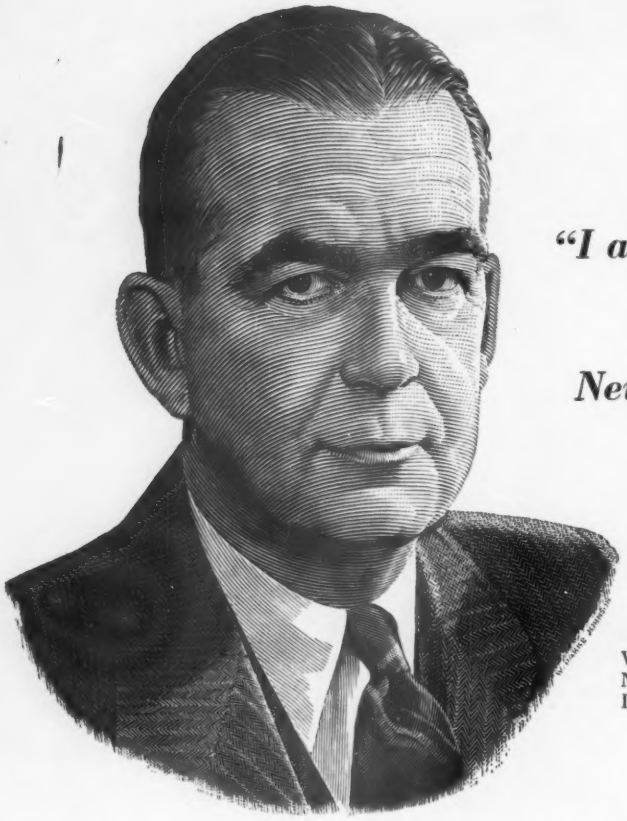

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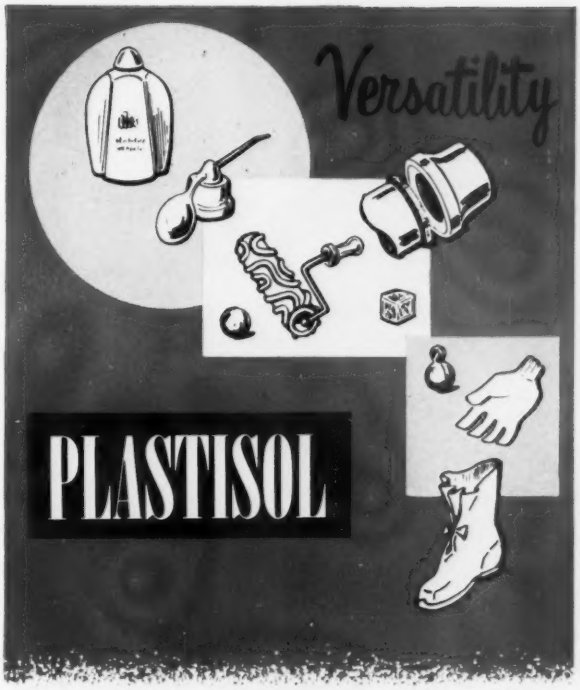

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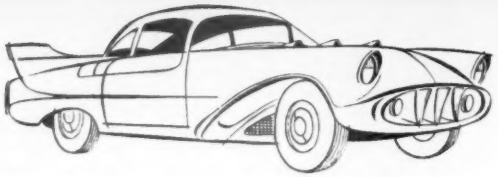

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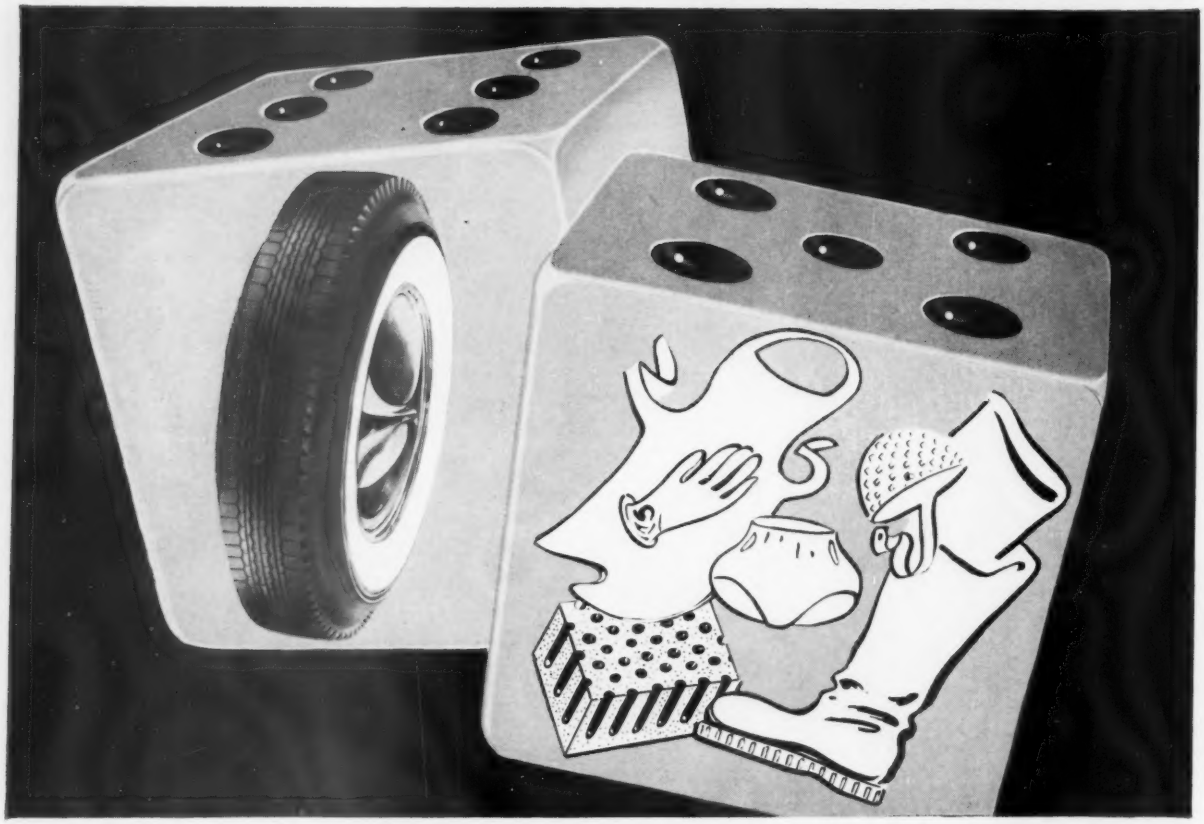

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POLYGARD® is a chemical stabilizer for *nonstaining* and *nondiscoloring* GR-S. It *keeps* light rubber light —gives *superior* color stability to your product.

Specifically designed to prevent staining and discoloring, POLYGARD gives excellent resistance to aging. It also prevents viscosity changes and gel increase during drying and high temperature processing.

POLYGARD stabilized polymers are used for whitewall tires, shoe soling, tiling, hospital sheeting, sponge rubber, wire insulation, and many other products. Since POLYGARD stabilized GR-S rubber is fully equivalent to staining type GR-S you can *now* use nonstaining GR-S in both white and black sidewall tires as well as in other products across the board.

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RUBBER AGE

Vol. 77, No. 2 MAY, 1955

A Study of GR-S Faceblank Compounds

By H. A. WINKELMANN

Dryden Rubber Division, Sheller Manufacturing Corp., Chicago, Ill.

and M. P. MARKS

U. S. Army, Chemical and Radiological Laboratories, Army Chemical Center, Maryland

(EDITOR'S NOTE: Readers should bear in mind that this article was prepared for publication on the basis of experiments conducted some time ago. Its subject matter, however, is of continuing interest. It should be noted that many of the polymers mentioned carry their earlier governmental designations.)

FOR several years the Chemical Corps has been faced with the necessity for developing synthetic elastomer formulations as possible substitutes for natural rubber items of issue. Major effort has been put on the gas mask, which is the major Chemical Corps rubber item now in commercial production.

The very design features of the new M-9-A1 model which give optimum mechanical performance make for extremely difficult molding. A hint of this problem is given in Figure A which shows cut-away sections of the air tubes that interconnect the air intake port with deflectors under each eye. The outer wall of this air tube is painted white in the photographs and is shown as passing from eye to eye by way of the enlarged double walled nose. Figure B shows outer and inner views, respectively, of the uncut faceblank.

In the past, attempts to use synthetic rubbers were not successful for many reasons, such as factory processing, cure, poor hot tear, stiffness at room or low temperatures, etc. The recent urgent requirement to

FIG. A—Cut-away sections of the air tubes of the new M-9-A1 gas mask.

TABLE I—GR-S POLYMERS EVALUATED IN FACEBLANK COMPOUNDS

Polymer	Monomer Ratio	% Bound Styrene	Polymer Temp. °F.	Mooney Visc. ML-4	Emulsifier	Coagulant	Remarks
X-599	71/29	23.5	41	52 ± 6	Dres. 214	Salt Acid	CHP or DIPHP or both. PBNA
X-565	71/29	23.5	41	55 ± 7	K-ORR Soap	Glue Acid	UBUB—CHP Sugar and iron free
X-602	71/29	23.5	0	50 ± 5	Dres. S-149 and K-ORR Soap	Salt Acid	Diox D or Diox 7
GR-S-100	75/25	20.0	41	52 ± 6	Dres. 214	Salt Acid	CHP or DIPHP or Diox 7
X-577	75/25	20.0	41	52 ± 6	Dres. 214	Salt Acid	Stalite. CHP or DIPHP or Diox. 7
GR-S-101	75/25	20.0	41	50 ± 5	Dres. 214	Salt Acid	CHP—BLE
X-580	75/25	20.0	41	50 ± 5	Dres. 214	Salt Acid	55 parts Philblack O on 100 parts GR-S-101
XP-203	85/15	12.5	122	50 ± 5	NaORR Soap	——	
XP-138	85/15	12.5	122	45 ± 5	Dres. 731	——	
X-600	90/10	8.0	41	38 ± 5	Dres. 214	Salt Acid	CHP or DIPHP PBNA
X-601	90/10	8.0	41	55 ± 7	K-ORR Soap	Glue Acid	CHP, Diethylene Triamine. BLE
X-489	95/5	4.0	122	55 ± 5	Dres. 731	Salt Acid	BLE
X-586	100/0	None	86	25 ± 5	Dres. 214		50 parts Philblack O on 100 parts Polybutadiene. CHP—BLE
X-629	75/25	——	41	——	Rosin Soap and Fatty Acid Soap	Salt Acid	Contains 25 parts Circosol 2XH/100 GR-S; Philblack O—50 parts/100 GR-S-X-628

TABLE II—COMPANIES PARTICIPATING IN TEST PROGRAM

Rubber Manufacturers		
Acushnet Rubber Co.	T. C. Edwards	X-600, X-601
Bond Rubber Co.	R. A. Podoloff H. Gordon	GR-S-101, X-580
Continental Rubber Works	G. McClelland	X-565, X-600
Dryden Rubber	H. A. Winkelmann	X-586, X-600
Faultless Rubber Co.	E. Whitted	X-521
Firestone Tire & Rubber Co.	J. J. Allen E. A. Harper	X-599
Gates Rubber Co.	W. Redmond	XP-138, XP-203, X-601
General Tire & Rubber Co.	D. Reahard	X-565, GR-S-100
B. F. Goodrich Co.	E. R. Cole	X-577, X-600
Goodyear Tire & Rubber Co.	S. C. Nicol A. S. Krivitsky	X-602, X-600
Industrial Rubber Goods Co.	W. S. Chinery	X-600, GR-S-100
Mine Safety Appliance Co.	R. C. Ford	X-601, Exp. Pol. No. 2
Standard Products Co.	E. A. Norris	X-602
Sun Rubber Co.	R. T. Cartlidge	GR-S-100, GR-S-101, X-580
United States Rubber Co.	H. N. Jackson	X-489, GR-S-101, X-580
Suppliers to the Rubber Industry		
Binney & Smith Co.	M. H. Leonard	GR-S-101, X-580
Continental Carbon Co.	L. D. Carver	X-600
C. P. Hall Co.	A. C. Peterjohn	GR-S-101, X-580
Monsanto Chemical Co.	D. E. Baker	X-601
Naugatuck Chemical Co.	F. L. Holbrook	GR-S-X-101
Phillips Chemical Co.	L. Harbison	X-601, X-478, X-629
United Carbon Co.	I. Drogin	X-601
R. T. Vanderbilt Co.	R. Schroyer	X-600

find an alternate material for natural rubber prompted the Chemical Corps to invite various rubber manufacturers to assist in evaluating a series of Low Temperature Polymers recommended by A. L. Rodde*, of the Rubber Reserve Corporation (Table I).

Study Handled in Two Phases

The first phase of this work based on laboratory tests indicated that better compounds may be made with these LT polymers than is possible with standard GR-S. The LTP compounds give low hardness and modulus with high tensile strength, elongation and resistance to tear. Compounds with improved hot tear resistance can be made with LT polymers. The low temperature properties of certain of these compounds are significant. Not only is it possible to make compounds with a very low temperature brittle point, but T-R curves show that some of them remain quite flexible at low temperatures.

Since this laboratory work was completed, faceblanks have been made on a pilot scale in the plants of four commercial rubber molders. Compression molding was done by U. S. Rubber Co., Mechanical Goods Division,

* Now with Naugatuck Chemical Division, U. S. Rubber Company.

FIG. B—Outer and inner views, respectively, of the uncut faceblank.

Table III—GR-S Faceblank Compounds

Acushnet Process Co.
Compound No. SC-1839

GR-S-X-600	100.00
ZnO XX78	4.00
Stearic Acid	2.00
Sterling 99	35.00
Paraflux	20.00
DOP	4.00
Heliozone	0.50
Agerite White	0.50
Agerite Resin D	1.00
Thionex	0.45
Sulfur	1.75
	169.20

Acushnet Process Co.
Compound No. SC-1752

GR-S-X-601	100.00
ZnO XX78	4.00
Stearic Acid	2.00
Sterling 99	35.00
Paraflux	20.00
DOP	4.00
Heliozone	0.50
Agerite White	0.50
Agerite Resin D	1.00
Thionex	0.45
Sulfur	1.75
	169.20

Bond Rubber Co.
Compound No. X-257

GRS-X-580	98.50
GRS-X-583	34.75
ZnO	5.00
Stearic Acid	2.00
SPDX-GH	1.00
808 MB	2.00
Sulfur	1.25
Flexol TOF	10.00
Agerite Resin D	1.00
Agerite White	0.50
	156.00
808 MB	
GRS-X-583	87.50
808	12.50
	100.00

Continental Carbon Co.
Compound No. 240-2

GR-S X-600	133.25
Sulfur	1.25
SPDX-GH	1.00
Acc. No. 808 MB	2.00
ZnO	5.00
Flexol TOF	10.00
Agerite Resin D	1.00
Agerite White	.00
Sunolite Wax	4.00
Continex HAF Black	30.00
	187.50
808 MB	
GR-S 583	87.50
808	12.50
	100.00

Continental Carbon Co.
Compound No. 240-1

GR-S X-600	133.25
SPDX-GH	1.00
Acc. No. 808 MB	2.00
Flexol TOF	10.00
Agerite Resin D	1.00
Agerite White	0.50
Stearic Acid	2.00
Zinc Oxide	5.00
Sulfur	1.25
	156.00

Continental Rubber Works
Compound No. 82671-E

GR-S-X-600	100.00
ZnO	5.00
Stearic Acid	2.00
Philblack O	45.00
Cumar EX	10.00
Flexol TOF	10.00
Sunproof	2.00
Agerite White	1.00
SPDX-GH	1.00
Phenex	0.25
Sulfur	1.50
	177.75

Continental Rubber Works
Compound No. 82671-F

GR-S-10	100.00
ZnO	5.00
Stearic Acid	2.00
Philblack O	45.00
Cumar EX	10.00
Flexol TOF	10.00
Sunproof	2.00
Agerite White	1.00
SPDX-GH	1.00
Phenex	0.25
Sulfur	1.50
	177.75

Dryden Rubber
Compound No. 938773-4

GR-S X-586	150.0
Zinc Oxide	5.0
Philblack A	
Heliozone	2.0
Altax	2.0
DOTG	
Stearic Acid	2.0
Sulfur	2.0
Agerite White	1.0
Dioctyl Adipate	10.0
	174.0

Dryden Rubber
Compound No. 938773-7

GR-S X-586	150.0
Zinc Oxide	5.0
Philblack A	
Heliozone	2.0
Altax	2.0
DOTG	1.5
Stearic Acid	2.0
Sulfur	2.0
Agerite White	1.0
Dioctyl Adipate	10.0
	175.5

Dryden Rubber
Compound No. 938773-8

GR-S-10	100.0
Zinc Oxide	5.0
Philblack A	30.0
Heliozone	2.0
Altax	2.0
DOTG	1.5
Stearic Acid	2.0
Sulfur	2.0
Agerite White	1.0
Dioctyl Adipate	10.0
	155.5

Dryden Rubber
Compound No. 938773-9

GR-S X-586	112.5
GR-S-10	25.0
Zinc Oxide	5.0
Philblack A	
Heliozone	2.0
Altax	2.0
DOTG	1.5
Stearic Acid	2.0
Sulfur	2.0
Agerite White	1.0
Dioctyl Adipate	10.0
	163.0

Dryden Rubber
Compound No. 938940

GR-S X-600	100.0
ZnO	5.0
Stearic Acid	1.0
P-33	70.0
BLE Powder	1.0
Agerite Powder	1.0
Syncera Wax	2.0
Flexol TOF	15.0
Thionex	0.4
Sulfur	1.7
	197.1

General Tire & Rubber Co.
Compound No. 13193-A

GR-S X-565	100.00
Santocure	1.50
Sulfur	1.75
Zinc Oxide	5.00
Stearex	1.00
Agerite White	1.00
EPC Black	20.00
Statex B Black	20.00
Heliozone	2.00
Process Oil	15.00
	167.25

General Tire & Rubber Co.
Compound No. 13238-M
Sun Revised

GR-S-100	100.00
SPDX GH	1.00
Phenex	0.25
Sulfur	1.00
ZnO	5.00
Stearic Acid	1.00
Flectol H	1.00
HAF Black	35.00
Circosol 2 XH	12.50
	156.75

Faultless Rubber Co.
Compound No. 500-R-4

GR-S X-521	100.00
SRF Black	40.00
Circo Lt. Oil	15.00
ZnO	2.00
Captax	2.00
Accel. 808	.50
Stearic Acid	.50
Flectol H	1.00
Agerite White	1.00
Sunproof	.75
Sulfur	3.00
Alamask LD	.20
	165.95

Firestone Tire & Rubber Co.
Compound No. A-217-N

GR-S-100	60.0
X-600	40.0
Santocure	2.0
Monex	0.2
Sulfur	2.0
ZnO	5.0
Stearic Acid	2.0
Sunproof Wax	2.0
Agerite White	1.0
HMF Black	22.5
HAF Black	20.0
Circo Lt. Oil	15.0
Cumar MH 2½	10.0
	181.7

Goodyear Tire & Rubber Co.
Compound No. ST-36-K-13

GR-S X-602	100.0
Hi-Sil	39.0
ZnO	5.0
Sulfur	2.5
Stearic Acid	2.0
Altax	1.0
Agerite White	1.0
Coumarone-Indene Resin	10.0
Light Process Oil	20.0
DOTG	1.5
Triethanolamine	2.0
	184.0

Goodyear Tire & Rubber Co.
Compound No. ST-36-K-20
Industrial Revised

GR-S X-600	100.000
ZnO	5.000
Cumar MH 2½	10.000
Agerite White	1.000
Light Circo Oil	15.000
Heliozone	2.000
Philblack O	40.000
Altax	1.500
Cumate	0.125
Sulfur	1.500
Stearic Acid	2.000
	178.125

TABLE III—GR-S FACEBLANK COMPOUNDS (CONT'D)

B. F. Goodrich Co.
Compound No. 8-ER-2-17

GR-S X-577	100.00
ZnO	5.00
Sulfur	1.50
Stearic Acid	1.00
Agerite Resin D	1.00
SPDX-GH	0.75
Dicapryl Phthalate	5.00
Cond. Prod. of Butyraldehyde and Aniline	0.25
	114.50

C. P. Hall Co.
Compound No. X-3765-A

GR-S X-580	98.50
GR-S 101	34.75
ZnO	5.00
Stearic Acid	2.00
Flexol TOP	10.00
SPDX-GH	1.00
Stabilite	1.00
Agerite White	0.50
Accelerator 808	0.25
Sulfur	1.25
	154.25

C. P. Hall Co.
Compound No. X-3765-B

GR-S X-580	98.50
GR-S 101	34.75
ZnO	5.00
Stearic Acid	2.00
Flexol TOP	10.00
SPDX-GH	1.00
Stabilite	1.00
Agerite White	0.50
Phenex	0.35
Sulfur	1.25
	154.35

Industrial Rubber Goods Co.
Compound No. FB-32-D

GR-S	100.00
ZnO	5.00
Philblack O	35.00
Stearic Acid	1.00
Sulfur	1.00
Plast. T.P. 90-B	15.00
Flectol H	1.00
SPDX-GH	1.00
808	0.25
Heliozone	2.00
	161.25

Industrial Rubber Goods Co.
Compound No. FB-30-O

GR-S-X-600	100.000
ZnO	5.000
Cumar MH 2½	10.000
Agerite White	1.000
Circo Lt. Oil	15.000
Heliozone	2.000
Philblack O	40.000
Altax	1.500
Cumate	0.125
Sulfur	2.500
Stearic Acid	2.000
	179.125

Mine Safety Appliance Co.
Compound No. S-285-363

GR-S Exp. No. 2	100.0
Sulfur	1.5
SPDX-GH	1.5
808	0.3
ZnO	5.0
Antioxidant 2246	1.0
Dixie Clay	12.0
Wyex	25.0
Heliozone	1.0
Stearic Acid	1.0
Paraflux	20.0
	168.3

Mine Safety Appliance Co.
Compound No. S-285-349

GR-S X-601	100.00
Sulfur	1.00
SPDX-GH	2.35
ZnO	5.00
Antioxidant 2246	.75
Wyex Black	35.00
Dixie Clay	12.00
Stearic Acid	1.00
Heliozone	1.00
Paraflux	15.00
Oil of Wintergreen	.25
	173.35

Naugatuck Chemical
Compound No. M-39212
Industrial Revised

MB-4	175.0
Butene	0.5
MBTS	2.0
Sulfur	1.0
	178.5

MB-4

GR-S-101	100.0
Cumar MH 2½	10.0
Protox ZnO	5.0
BLE 25	1.0
No. 8 Oil	15.0
Stearic Acid	2.0
Sunproof	2.0
Philblack O	40.0
	175.0

Phillips Chemical Co.
Compound No. 1-PB-573

GR-S X-629	122.50
GR-S X-478	28.00
ZnO	5.00
Agerite Resin D	1.00
Antioxidant 2246	1.00
Stearic Acid	2.00
Circo Lt. Oil	5.00
808 MB (12.5)	2.25
SPDX-GH	1.10
Tricresyl Phosphate	5.00
Sulfur	1.25
	169.10

Standard Products Co.
Compound No. LB-727

GR-S X-602	100.0
ZnO	5.0
Stearic Acid	1.0
P-33 Black	70.0
Thermoflex A	1.0
Flectol H	1.0
Syncera Wax	2.0
Flexol TOF	15.0
Thionex	0.4
Sulfur	1.7
	197.1

Sun Rubber Co.
Compound No. 5-D-75

GR-S-100	100.00
HAF Black	35.00
Plast. TP-90-B	15.00
ZnO	5.00
Stearic Acid	1.00
SPDX	1.00
808	0.25
Flectol H	1.00
Sulfur	1.00
	159.25

U. S. Rubber Co.
Compound No. 34556-B-1

GR-S X-489	100.0
Zinc Oxide	5.0
Philblack O	40.0
Trioctyl Phosphate	15.0
Paraffin Oil	5.0
Paraffin Wax	1.0
Stearic Acid	1.6
Monex	0.4
OXAF	0.8
Sulfur	0.8
	169.6

R. T. Vanderbilt Co.
Compound No. A-14
Standard Revised

GR-S-X-600	100.0
ZnO	5.0
Stearic	1.0
Sulfur	1.5
Rio Resin	10.0
Plastogen	10.0
Sunproof	2.0
MPC Black	40.0
Ethyl Tellurac	0.8
	170.3

Passaic, N. J., and by the Sheller Manufacturing Corp., Dryden Rubber Division, Chicago, Illinois. Transfer molding was accomplished by Bond Rubber Corp., Derby, Conn. and by Firestone Industrial Products, Inc., Fall River, Mass. In each case the materials were processed and cured without difficulty after short initial periods of technique development. Molding quality level in one plant was equivalent to its current production with a natural rubber formulation.

The rubber manufacturers listed in Table II took part in the first phase of this study, viz., The Selection of Polymers (Tables IV to VI, Figures 1 to 8). Each manufacturer selected a polymer and submitted a compound designed for use in a GR-S faceblank with the best obtainable physical properties. There were no specifications compiled for a GR-S faceblank compound. Each manufacturer attempted to make the best compound from a given polymer for use in a faceblank. At the conclusion of this study four polymers were selected for further investigation.

In Phase II of this program, each of the four selected polymers was compounded into the four best compounds of Phase I. Revisions of the four compounds often resulted in improved physical properties. In the second phase, the suppliers of raw materials to the rubber industry (Table II) were invited, along with the rubber manufacturers, to assist in the development of a GR-S faceblank compound. GR-S compounds with good physical properties, hot tear resistance and excellent low temperature characteristics have been developed in this cooperative study.

Some of the compounds developed in the study are given in Table III. Original cures were run 8 minutes at 307°F. All compounds, with few exceptions, were oven aged seven days at 158°F. and aged in the oxygen bomb 48 hours at 80°C., using 50 pounds oxygen.

PHASE I

Selection of GR-S Polymers

(Table IV, Figures 1 to 8)

The GR-S compounds using various polymers are listed in Table IV and Figure 1 in the order in which they are rated based on modulus, tensile strength, percent elongation and resistance to tear before and after oven and oxygen bomb aging. Equal weight was given to modulus, tensile strength and resistance to tear in establishing the ratings.

The following index was used in making the ratings:

Modulus	— Low	= 1
Tensile Strength	— High	= 1
% Elongation	— High	= 1
Resistance to Tear	— High	= 1

The compounds selected as the best are the following:

Rating	*Polymer*	*Company*	*Code*
1	XP-138	Gates	5
2	X-601	Acushnet	SX-1752
3	GR-S-100	Sun	5-D-75
	X-602	Standard Products	LB-727-F
	GR-S-101	Bond	X-257
4	X-602	Goodyear	ST-36-K-13
5	XP-203	Gates	6
6	X-600	Industrial Rubber	FB-30-0

XP-138 and XP-203 are pilot plant experimentals and are not in experimental production. No further work was conducted with these polymers. XP-138 gives the best rating even though the original tensile strength is low. The aged tensile strength is much improved. XP-138 was tested in a gray compound and a higher tensile might be attained using carbon blacks.

X-602 which looks good in both gray (Goodyear) and black (Standard Products) compounds was not considered in further tests because it is made at 0°F. for which only pilot plant facilities exist. X-602 is a high styrene copolymer and still rates among the best. The question may well be asked whether X-600 and X-601 would show a like improvement if they were polymerized at 0°F.

The polymers selected for further work are as follows: X-580 and GR-S-101, GR-S-100, X-600, and X-601.

Compounds with low modulus and high tensile strength, elongation and resistance to tear in a low hardness range can be prepared with these polymers. Some of these compounds show a high modulus before and after oven and oxygen bomb aging and have not been considered for further study even though the other physical properties are very good (see Table IV and Figures 1 to 8).

Low Temperature Brittleness Tests

(Tables V, VI and VII)

Low temperature brittleness tests were run by the Thiokol Method (ASTM D 736-46T) before and after oven aging for seven days at 158°F. Tests were run in duplicate at —40°F. after conditioning for five hours prior to testing. All compounds tested OK at —40°F. both before and after oven aging.

TABLE IV—PHYSICAL PROPERTIES OF GR-S COMPOUNDS

Polymer	Code	Company	Cure °F.	Original Mod. 200%	Original Tens. psi	Original % Elong.	Original Lbs. Tear	Oven Aged—7 Days at 158°F.— Mod. 200%	Oven Aged—7 Days at 158°F.— Tens. psi	Oven Aged—7 Days at 158°F.— % Elong.	Oven Aged—7 Days at 158°F.— Lbs. Tear	Oxygen Bomb—48 Hrs. at 80°C.—50 lb. Pressure Mod. 200%	Oxygen Bomb—48 Hrs. at 80°C.—50 lb. Pressure Tens. psi	Oxygen Bomb—48 Hrs. at 80°C.—50 lb. Pressure % Elong.	Oxygen Bomb—48 Hrs. at 80°C.—50 lb. Pressure Lbs. Tear
XP-138	5	Gates	9′ x 300	100	1225	950	325	250	1800	710	230	300	1750	685	200
X-601	SX-1752	Acushnet	8′ x 330	195	2400	905	141	280	1800	700	135	275	2085	750	137
GR-S-100	5-D-75	Sun	5′ x 328	211	2236	699	220	292	1707	487	246	229	1682	515	205
X-602	LB-727-F	Stand. Prod.	45′ x 300	240	2110	820	240	309	1845	735	169	275	1310	740	186
X-580	X-257	Bond	6′ x 340	290	2790	700	226	424	2620	560	238	—	—	—	—
X-602	ST-36-K-13	Goodyear	4′ x 310	210	1755	796	113	332	1590	596	151	—	1668	745	100
XP-203	6	Gates	9′ x 300	200	1725	655	225	400	1450	465	175	200	1525	560	240
X-600	FB-30-O	Indus. Rub.	7′ x 320	267	2012	658	256	718	1747	350	182	532	1743	442	195
X-565	13193-A	General	20′ x 320	420	2670	567	154	653	1998	397	140	655	2172	437	154
X-521	500-R-4	Faultless	8′ x 307	343	1772	645	132	576	1697	450	127	442	1882	570	119
X-577	8-ER-2-17	Goodrich	15′ x 307	211	1293	570	94	215	1088	454	68	251	1242	508	84
X-565	BS-8267I-B	Cont. Rubber	18′ x 316	365	1653	470	170	489	1658	393	145	490	1650	437	191
X-489	34556-B1	U. S. Rubber	20′ x 307	400	1575	475	236	617	1300	338	180	500	1375	408	187
X-586	93873-4	Dryden	15′ x 316	415	1605	515	260	900	1860	335	140	1035	1660	290	146
X-601	S-285-349	Mine Safety	7′ x 320	310	1603	734	249	—	—	—	—	283	2280	727	283
X-599	A-217-B	Firestone	8′ x 320	273	1625	603	246	630	1428	390	—	—	—	—	—

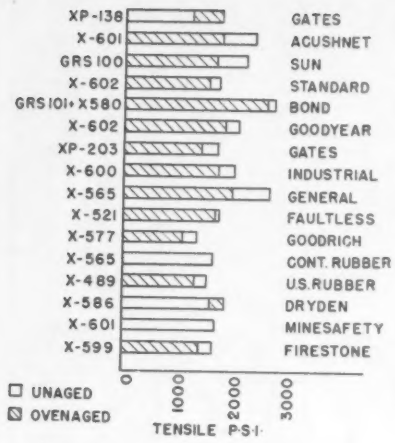


FIG. 1—GR-S Polymers.

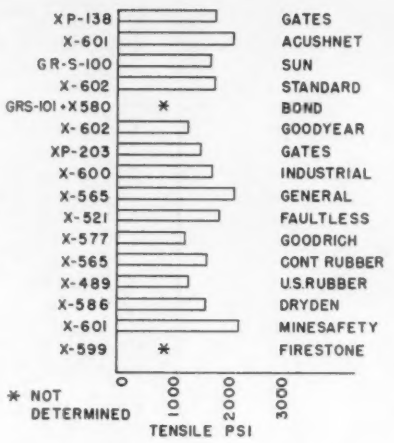


FIG 2—GR-S Polymers—Oxygen Bomb.

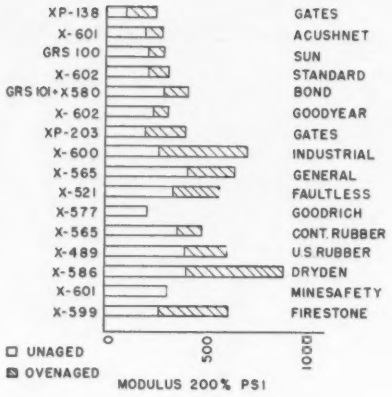


FIG. 3—GR-S Polymers.

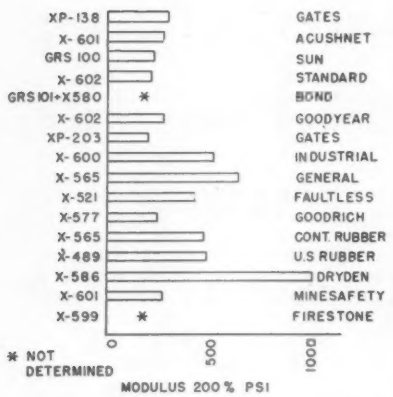


FIG. 4—GR-S Polymers—Oxygen Bomb.

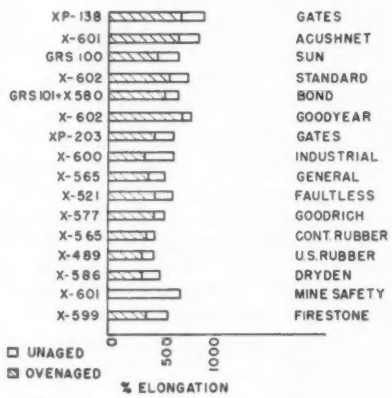


FIG. 5—GR-S Polymers.

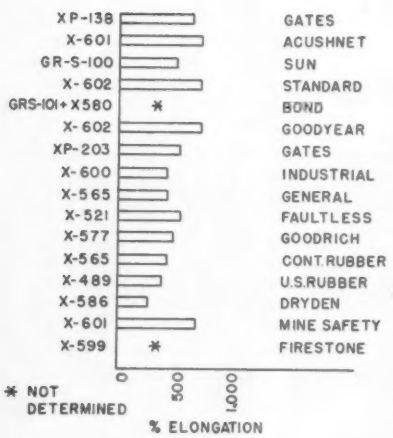


FIG. 6—GR-S Polymers—Oxygen Bomb.

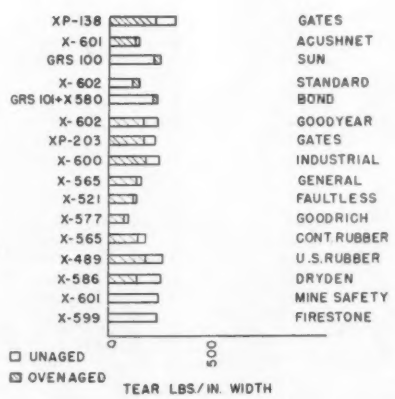


FIG. 7—GR-S Polymers.

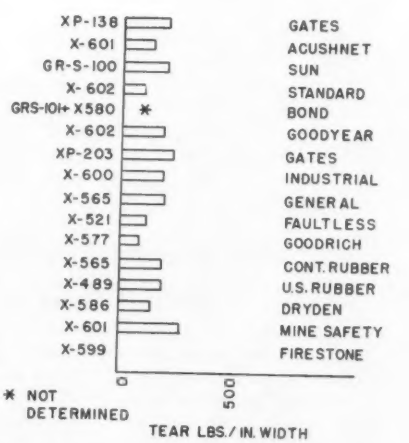


FIG. 8—GR-S Polymers—Oxygen Bomb.

TABLE V—THIOKOL VS SOLENOID (SCOTT) LOW TEMPERATURE BRITTLENESS TEST

(Tested by V. L. Smithers Laboratories)

	Thiokol (D736-46 T)			Solenoid (D746-44 T)		
	—70°F.	—75°F.	—80°F.	—70°F.	—75°F.	—80°F.
1—Goodrich (GR-S X-577)	OK	OK	OK	OK	OK	Failed
2—Bond (GRS 101/580)	OK	OK	OK	OK	OK	OK
3—Faultless (GRS X-521)	OK	OK	Failed	OK	Failed	Failed
4—Standard (GRS X-602)	OK	Failed	Failed	Failed	Failed	Failed
5—Standard (GRS-10 Control)	OK	OK	Failed	OK	OK	Failed
6—Sun (GR-S 100)	OK	OK	OK	OK	OK	OK
7—U. S. (GRS-10 Control)	OK	OK	OK	OK	OK	OK
8—U. S. (GRS X-489)	OK	OK	OK	OK	OK	OK
9—Dryden (GRS-10 Control)	OK	Failed	Failed	OK	Failed	Failed
10—Dryden (GRS X-586)	OK	OK	OK	OK	OK	OK
11—Industrial (GRS X-600)	OK	OK	OK	OK	OK	Failed
12—Industrial (GRS-10 Control)	Failed	Failed	Failed	Failed	Failed	Failed
13—General (GRS X-565)	OK	OK	OK	OK	OK	OK
	Conditioned 1 Hour at above temperatures			Conditioned 3' in Acetone at above temperatures		

	Compound	*Polymer*
B. F. Goodrich Co.	8-ER-2-17-15 x 60	GRS-X-577
Bond Rubber Co.	E-275-AM	GRS-X-583/580
Faultless Rubber Co.	R-4	GRS-521
Standard Products	LB-727	GRS-X-602
Standard Products	LB-727-F	GRS-10 Control
Sun Rubber Co.	5-D-75	GRS-611
U. S. Rubber Co.	S-34556-C-1	GRS-10 Control
U. S. Rubber Co.	S-34556-B-1	GRS-X-489
Dryden Rubber	938773-6	GRS-10 Control
Dryden Rubber	938773-4	GRS-X-586
Industrial Rubber Goods	FB-30-O	GRS-X-600
Industrial Rubber Goods	FB-30-P	GRS-10 Control
General Tire & Rubber Co.	13193-A	GRS-X-565

Low temperature brittleness tests were run at —70°, —75° and —80°F. by the Thiokol and Solenoid methods (Table V). The two methods check quite closely although the Solenoid method is more sensitive. It is interesting to note that the Industrial, Dryden and Standard Products GR-S-10 control compounds fail at —80°F. or above, but the U. S. Rubber compound is satisfactory.

Low temperature brittleness tests were conducted by the Solenoid method down to —97°F., which is the practical limit of the instrument (Table VI). There are four compounds in this series which are OK at —97°F. Even the poorest compounds tested are not brittle until —65°F. is reached. With the proper selection of polymer it is possible to make compounds with better low temperature properties than with standard GR-S.

Low temperature brittleness tests were run by the Solenoid method on a natural rubber faceblank compound containing 85 percent rubber by volume (Table VII). These results show that the GR-S compounds compare favorably with natural rubber in low temperature brittleness and some GR-S compounds have a much lower brittle point (see Table VI). It should be noted that these effects were produced by rapid drop from ambient to extremely low temperature without pause at the relatively high temperature (circa —20 to —25°F.) at which natural rubber crystallizes.

TABLE VI—SOLENOID BRITTLE POINT TESTS

(Solenoid Tester)

(Tested by DuPont Rubber Laboratories)

Supplier	Polymer	Code	ASTM D746 Solenoid Brittle Point—°F.
U. S. Rubber	GR-S X-489	34556-B1	OK @ —95
U. S. Rubber	GR-S-10	34556-C1	—94
General	X-565	13193-A	—87
Dryden	X-586	938773-7	OK @ —95
Dryden	X-586 and GR-S-10	938773-8	—72
Dryden	X-586	938773-9	OK @ —95
Ind. Rubber	X-600	FB-30-O	—90
Acushnet	X-601	SX-1752	OK @ —95
Std. Prod.	X-602	LB-727-F	—72
Std. Prod.	GR-S-10	LB-727-F	—72
Faultless	X-521	500-R-4	—65
Bond	X-580 and GR-S-101	X-257	—65
Goodrich	X-577	8-ER-2-17	—76
Sun	GR-S-100	5-D-75	—93

In order to lower the temperature below —95°F., carbon ice was added to the acetone bath with no acetone circulation. By this means a temperature of —97°F. was obtained. When tested by the ASTM D746 method, results were as follows:

U. S. Rubber	X-489	34556-B1	OK
Dryden	X-586	938773-7	OK
Dryden	X-586	938773-9	OK
Acushnet	X-601	SX-1752	OK

TABLE VII—LOW TEMPERATURE BRITTLENESS

(Solenoid Method)

Natural Rubber Faceblank Compound	—67°F.	—76°F.
Unaged	OK	Failed
Oven Aged 48 Hr. at 212°F.	OK	Failed

Low Temperature Flexibility

(Table VIII, Figures 9 to 13) (Table XIV, Figures 22 and 23)

Low temperature flexibility tests were made according to the T-R test method by the General Tire and Rubber Co. The T-R low temperature method, developed by Svetlick and Sperberg, utilizes the T-50 test equipment developed by Naugatuck Chemical. The only modification of this instrument is the scribing of retraction points on the specimen holder.

Briefly, the test method involves the die cutting of a T-50 test sample to a four inch measured length, insertion of this sample into the specimen holder and

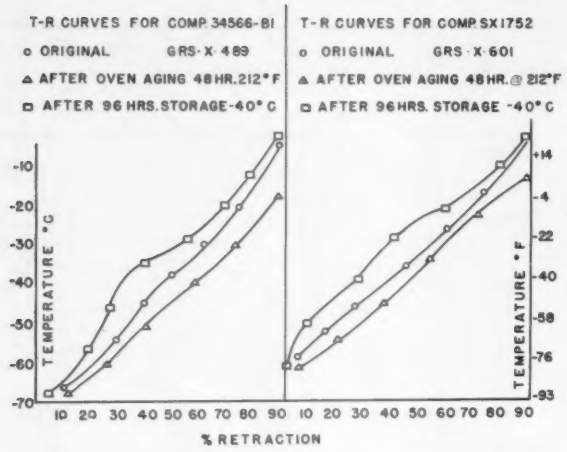

T-R CURVES FOR COMP. 34566-B1
o ORIGINAL GRS-X-489
△ AFTER OVEN AGING 48HR. 212°F
□ AFTER 96 HRS. STORAGE -40°C
T-R CURVES FOR COMP. SX1752
o ORIGINAL GRS-X-601
△ AFTER OVEN AGING 48HR. @ 212°F
□ AFTER 96HRS. STORAGE -40°C
TEMPERATURE °C
TEMPERATURE °F
% RETRACTION

FIG. 9—T-R Curves.

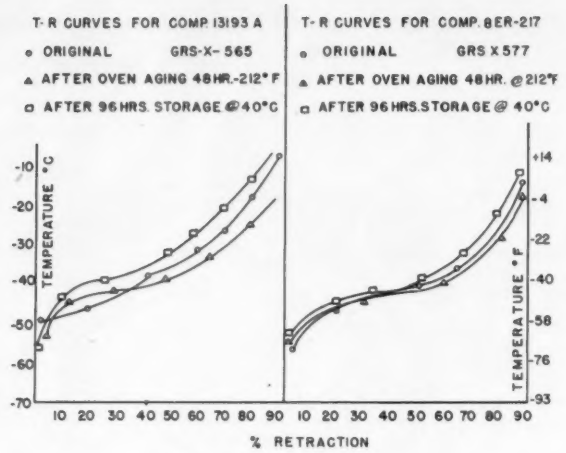

T-R CURVES FOR COMP. 13193 A
o ORIGINAL GRS-X-565
△ AFTER OVEN AGING 48HR.-212°F
□ AFTER 96HRS. STORAGE @ 40°C
T-R CURVES FOR COMP. 8ER-217
o ORIGINAL GRS X577
△ AFTER OVEN AGING 48HR. @ 212°F
□ AFTER 96HRS. STORAGE @ 40°C
TEMPERATURE °C
TEMPERATURE °F
% RETRACTION

FIG. 10—T-R Curves.

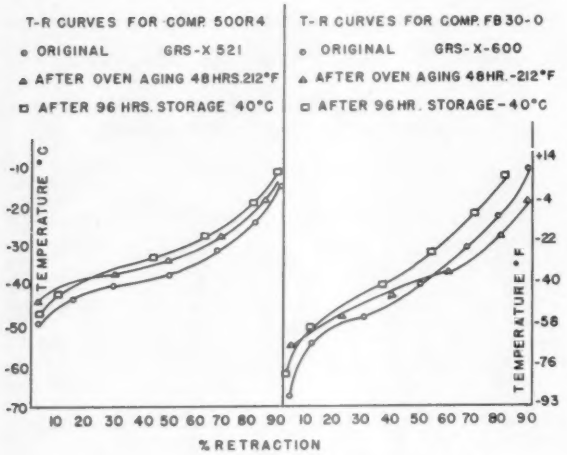

T-R CURVES FOR COMP. 500R4
o ORIGINAL GRS-X 521
△ AFTER OVEN AGING 48HRS. 212°F
□ AFTER 96 HRS. STORAGE 40°C
T-R CURVES FOR COMP. FB30-O
o ORIGINAL GRS-X-600
△ AFTER OVEN AGING 48HR. -212°F
□ AFTER 96HR. STORAGE -40°C
TEMPERATURE °C
TEMPERATURE °F
% RETRACTION

FIG. 11—T-R Curves.

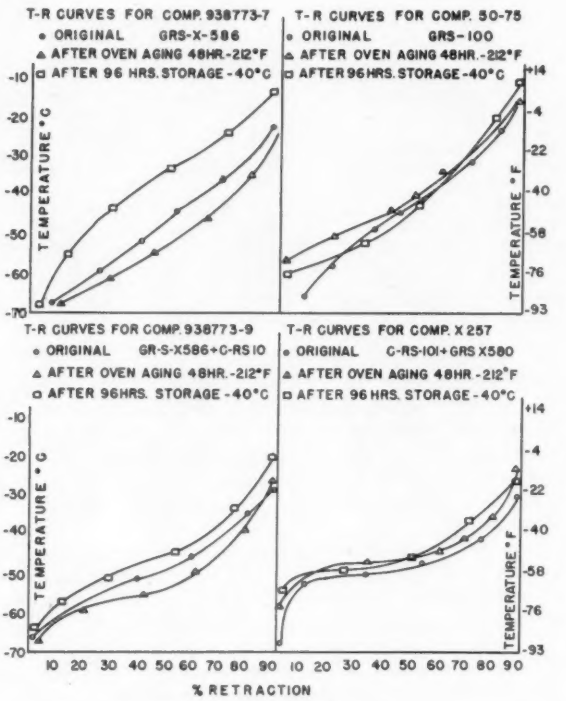

T-R CURVES FOR COMP. 938773-7
o ORIGINAL GRS-X-586
△ AFTER OVEN AGING 48HR.-212°F
□ AFTER 96 HRS. STORAGE -40°C
T-R CURVES FOR COMP. 50-75
o ORIGINAL GRS-100
△ AFTER OVEN AGING 48HR.-212°F
□ AFTER 96HRS. STORAGE -40°C
T-R CURVES FOR COMP. 938773-9
o ORIGINAL GR-S-X586+C-RS10
△ AFTER OVEN AGING 48HR.-212°F
□ AFTER 96HRS. STORAGE -40°C
T-R CURVES FOR COMP. X257
o ORIGINAL C-RS-101+GRS X580
△ AFTER OVEN AGING 48HR -212°F
□ AFTER 96 HRS. STORAGE -40°C
TEMPERATURE °C
TEMPERATURE °F
% RETRACTION

FIG. 12—T-R Curves.

TABLE VIII—LOW TEMPERATURE FLEXIBILITY

T-R TEST

Company	Compound	Polymer	% Retraction at —40°C. Original	Oven Aged 48 Hr. @ 212°F.	After 96 Hr. Storage @ —40°C.
Faultless	500-R-4	GR-S X-521	25	11	14
Standard	LB-727-F	GR-S X-602	42	26	33
Industrial	FB-30-O	GR-S-X-600	50	49	38
U. S. Rubber	34556-C1	GR-S-10	41	50	30
General	13193-A	GR-S-X-565	41	45	26
U. S. Rubber	34556-B1	GR-S-X-489	47	—59	31
General	13193-A	GR-S-X-565	41	45	26
Acushnet	SX-1752	GR-S-X-601	40	47	27
Dryden	938773-7	GR-S-X-586	63	75	39
Sun	5-D-75	GR-S-100	58	55	58
Dryden	938773-8	GR-S-10	60	64	55
Dryden	938773-9	GR-S-X-586 and GR-S-10	73	77	66
Goodrich	8-ER-2-17	GR-S-X-577	54	60	52
Bond	X-257	GR-S-101 and X-580	77	68	66

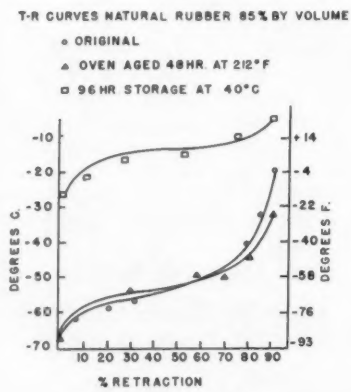


FIG. 13—T-R Curves.

TABLE IX—COMPOUNDS USING GR-S-100

Compound	Company	Formula	Cure—°F.	Mod. 200%	Tens. psi	% Elong.	Hard.	Tear Room Temp.	Tear 212°F.	Tear Firestone Ring Tear Test at 250°F. Lbs./.25" Ring
			Original							
5-D-75	Sun	Sun	5′ x 328	211	2236	699	—	220	—	—
FB-31-H	Industrial	Sun	6′ x 320	278	2060	670	44	223	117	75
FB-32-D	Industrial	Sun Revised	8′ x 320	243	2103	713	42	219	105	75
13238-M	General	Sun Revised	9′ x 307	198	2390	835	39	247	71	102
A-217-N-10	Firestone	———	10′ x 307	400	1700	505	—	143	—	—
			Oven Aged 7 Days at 158°F.							
5-D-75	Sun	Sun		292	1707	487	—	246	—	—
FB-31-H	Industrial	Sun		506	2040	497	50	229	—	—
FB-32-D	Industrial	Sun Revised		395	2407	570	49	223	—	—
13238-M	General	Sun Revised		308	2960	700	46	208	—	—
A-217-N	Firestone	———		1350	1925	265	—	93	—	—
			Oxygen Bomb 48 Hours at 80°C., 50 lb. Pressure							
5-D-75	Sun	Sun		229	1682	515	—	205	—	—
FB-31-H	Industrial	Sun		394	1550	534	47	217	—	—
FB-32-D	Industrial	Sun Revised		349	2132	650	45	221	—	—
13238-M	General	Sun Revised		313	2507	726	49	213	—	—

stretching to 50% elongation. The stretched specimen is immersed in an acetone bath which has previously been cooled down to —68°C. by circulation through coils cooled by dry ice. After a three minute stabilization period the catch on the specimen holder is released and the test sample is allowed to retract. The temperature is allowed to rise at the rate of one degree per minute. The temperature at which 1, 2, 3, 5, 10, and up to 90% retraction occurs is recorded. These temperature points are then plotted against per cent retraction and a smooth curve is drawn through these points.

It is not expected that faceblanks would be used at temperatures of —60° to —90°F. However, the compounds which show the maximum retraction at —40°F. would certainly be more serviceable than those with a low degree of retraction at this temperature. Thus, although all compounds passed the —40° and —65°F. Thiokol and Solenoid tests, anyone trying on a mask at these temperatures would certainly prefer Compound 938940 to Compound V-2470-A-14 (Figure 23).

T-R tests were made before and after oven aging for 48 hours at 212°F. and after 96 hours storage at —40°F. Oven aging tests show the effect of plasticizer loss as well as the effect of any change in polymer structure resulting from this heat treatment. When the T-R curve after oven aging is much higher than before, excessive loss of plasticizer is indicated. Crystallization of the polymer is shown by a steep retraction curve before and after storage at low temperatures.

Some of the compounds in Phase I (Table VIII) would be very stiff at —40°F. or below and their retraction properties would be poor. These are listed as follows:

Company	*Compound*	*Polymer*	*Figure*
Faultless	500-R-4	GR-S-X-521	11
Industrial	FB-30-O	GR-S-X-600	11
General	13193-A	GR-S-X-565	10
U. S. Rubber	34556-C1	GR-S-10	—

The following compounds show crystallizing tendencies when stored at —40°F.:

Company	*Compound*	*Polymer*	*Figure*
Acushnet	SX-1752	GR-S-X-601	9
Bond	X-257	GR-S-101 and X-580	12
Dryden	938773-7	GR-S-X-586	12
General	13193-A	GR-S-X-565	10
U. S. Rubber	34556-B1	GR-S-X-489	9

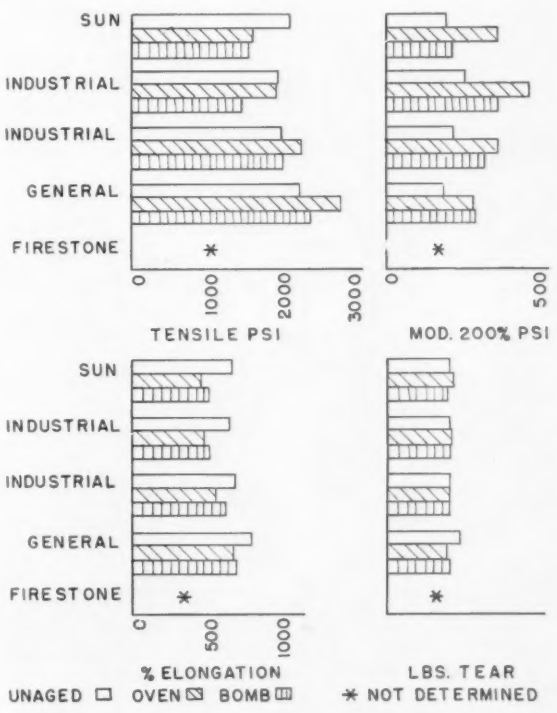


FIG. 14—GR-S 100.

TABLE X—COMPOUNDS USING GR-S-101 AND X-580

Compound	Company	Formula	Cure—°F.	Mod. 200%	Tens. psi	% Elong.	Hard.	Tear: Room Temp.	Tear: 212°F.	Tear: Firestone Ring Tear Test at 250°F. Lbs./.25" Ring
			Original							
X-257	Bond	Bond	6' x 340	290	2790	700	—	226	—	—
5-D-78	Sun	Bond	5' x 307	199	2185	877	41	194	117.00	66
L	Naugatuck	Industrial	9' x 307	330	2610	730	47	188	—	—
M-39212	Naugatuck	Industrial Revised	12' x 307	200	2640	850	44	163	57.17	104
R-5815-3	Binney & Smith	Sun	8' x 307	220	2240	750	38	270	98.00	—
X-3765-A	C. P. Hall	Bond	8' x 307	295	2765	750	45	160	65.00	106
X-3765-B	C. P. Hall	Bond Revised	8' x 307	290	2945	770	45	160	78.33	96
			Oven Aged 7 Days at 158°F.							
X-257	Bond	Bond		424	2620	560	—	238	—	—
5-D-78	Sun	Bond		337	2365	635	46	175	—	—
L	Naugatuck	Industrial		950	2130	350	63	—	—	—
M-39212	Naugatuck	Industrial Revised		340	2780	700	50	—	—	—
R-5815-3	Binney & Smith	Sun		—	—	—	—	—	—	—
X-3765-A	C. P. Hall	Bond		450	2425	530	51	130	—	—
X-3765-B	C. P. Hall	Bond Revised		450	2810	580	51	115	—	—
			Oxygen Bomb 48 Hours at 80°C., 50 lb. Pressure							
X-257	Bond	Bond		—	—	—	—	—	—	—
5-D-78	Sun	Bond		277	2410	776	44	164	—	—
L	Naugatuck	Industrial		650	2010	400	58	—	—	—
M-39212	Naugatuck	Industrial Revised		350	2530	720	47	—	—	—
R-5815-3	Binney & Smith	Sun		360	2110	670	42	—	—	—
X-3765-A	C. P. Hall	Bond		320	2750	660	49	140	—	—
X-3765-B	C. P. Hall	Bond Revised		335	2975	690	49	135	—	—

TABLE XI—COMPOUNDS USING X-600

Compound	Company	Formula	Cure—°F.	Mod. 200%	Tens. psi	% Elong.	Hard.	Tear: Room Temp.	Tear: 212°F.	Tear: Firestone Ring Tear Test at 250°F. Lbs./.25" Ring
			Original							
FB-30-O	Industrial	Industrial	7' x 320	267	2012	658	—	256	—	—
82671-E	Cont. Rubber	Industrial Revised	10' x 308	274	2515	668	—	247	81.67	129
8-ER-2-20	Goodrich	Industrial	8' x 307	223	1341	620	44	435	9.90	32
ST-36-K-20	Goodyear	Industrial Revised	8' x 307	200	1950	795	40	230	38.27	56
938940	Dryden	Standard	6' x 307	209	655	640	47	118	47.00	12
A-1-R	Vanderbilt	Standard	8' x 307	240	1520	760	46	130	—	—
240-1	Cont. Carbon	———	10' x 307	25	320	625	76	45	—	—
240-2	Cont. Carbon	Bond Revised	10' x 307	85	1600	850	60	170	8.26	38
A-14	Vanderbilt	Standard Revised	8' x 307	200	2100	870	46	230	65.00	50
			Oven Aged 7 Days at 158°F.							
FB-30-O	Industrial	Industrial		718	1747	330	—	182	—	—
82671-E	Cont. Rubber	Industrial Revised		392	2548	580	—	221	—	—
8-ER-2-20	Goodrich	Industrial		611	1483	340	55	403	—	—
ST-36-K-20	Goodyear	Industrial Revised		400	2050	537	50	163	—	—
938940	Dryden	Standard		377	567	380	55	91	—	—
A-1-R	Vanderbilt	Standard		320	650	480	53	80	—	—
240-1	Cont. Carbon	———		75	245	440	49	40	—	—
240-2	Cont. Carbon	Bond Revised		205	1665	620	39	225	—	—
A-14	Vanderbilt	Standard Revised		340	2460	630	60	250	—	—
			Oxygen Bomb 48 Hours at 80°C., 50 lb. Pressure							
FB-30-O	Industrial	Industrial		532	1743	442	—	195	—	—
82671-E	Cont. Rubber	Industrial Revised		355	2577	627	—	241	—	—
8-ER-2-20	Goodrich	Industrial		514	1051	324	50	337	—	—
ST-36-K-20	Goodyear	Industrial Revised		237	2075	735	43	192	—	—
938940	Dryden	Standard		300	470	413	53	79	—	—
A-1-R	Vanderbilt	Standard		280	870	630	51	90	—	—
240-1	Cont. Carbon	———		170	315	450	38	45	—	—
240-2	Cont. Carbon	Bond Revised		190	1625	650	39	180	—	—
A-14	Vanderbilt	Standard Revised		260	2220	740	52	200	—	—

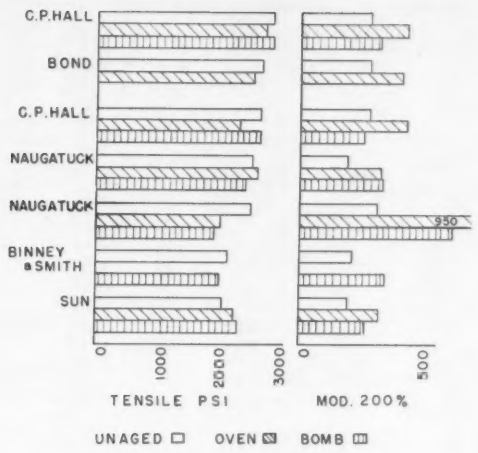


FIG. 15—GR-S 101 + X-580.

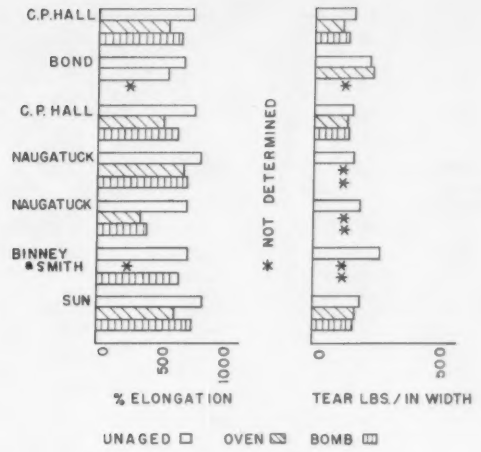


FIG. 16—GR-S 101 + X-580.

The compounds giving the best T-R curves in the Phase I (Table VIII) study are the following:

Company	*Compound*	*Polymer*	*Figure*
Bond	X-257	GR-S-101 and X-580	12
Dryden	938773-9	GR-S-586	12
Goodrich	8-ER-2-17	GR-S-X-577	10
Sun	5-D-75	GR-S-100	12

Table XIV presents a classification of the compounds and polymers of Phase II based on the percent retraction of —40°, —50° and —60°C.

Figure 22 gives retraction curves for the most (240-1) and least flexible (M-39212) compounds at temperatures from —10° to —70°C. Two intermediate compounds are shown, S-285-363 (Experimental Polymer No. 2) and FB-32-D (GR-S-100). The T-R curves for all compounds fall between the limits of compounds 240-1 and M-39212. It will be noted that there is a marked difference in stiffness at —40° and —50°C. between the four compounds shown in Figure 22.

Figure 23 gives the retraction curves of three compounds containing X-600. Compound 938940 gives very much higher retraction at —40° and —50°C. than compounds ST-36-K-20-F and V-2470-A-14. Low temperature flexibility of a given polymer is affected by the compounding materials used.

PHASE II

After the conclusion of Phase I portion of this study, further compounding studies were made with GR-S-100, GR-S-101 and X-580, GR-S-X-600 and GR-S-X-601. Tests were also run using Experimental Polymer No. 2 (non-staining X-601) and a blend of X-478 and X-629.

Various Compounds Using GR-S-100
(Table IX, Figure 14)

Five compounds using GR-S-100 were evaluated before and after oven and oxygen bomb aging. Based on physical tests, Compound 13238-M gives the best results. Low temperature flexibility tests run by the T-R method indicate that compounds FB-31-H and FB-32-D are more flexible at low temperatures than 13238-M (Table XIV).

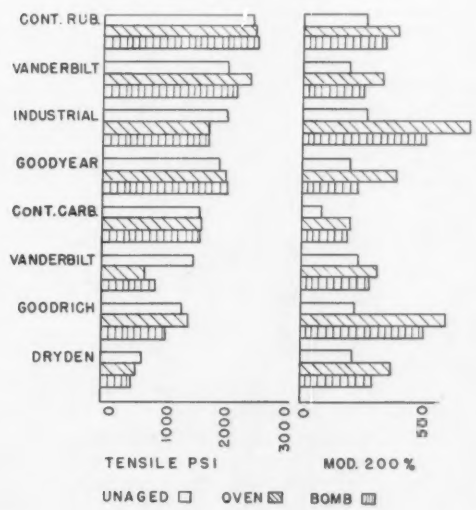


FIG. 17—GR-S X-600.

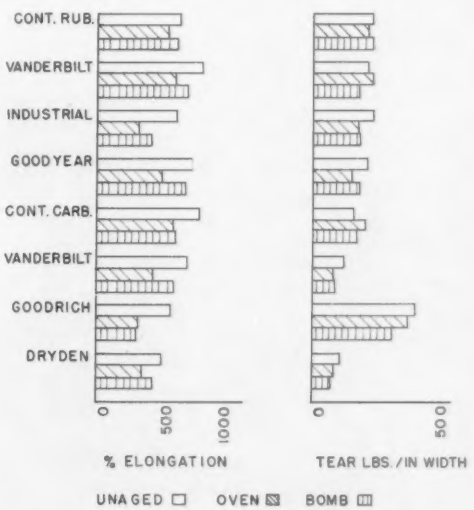


FIG. 18—GR-S X-600.

TABLE XII—COMPOUNDS USING X-601

Compound	Company	Formula	Cure—°F.	Mod. 200%	Tens. psi	% Elong.	Hard.	Tear: Room Temp.	Tear: 212°F.	Tear: Firestone Ring Tear Test at 250°F. Lbs./.25" Ring
			Original							
SC-1752	Acushnet	Acushnet	8' x 330	195	2400	905	—	141	—	—
D-10428-A	Monsanto	Industrial	10' x 307	361	2032	502	50	183	69.00	11
D-10428-B	Monsanto	Industrial Revised	10' x 307	356	2250	530	52	186	74.00	48
1-PB-599	Phillips	Bond	8' x 307	163	1860	787	43	159	82.00	34
———	United Carbon	Sun	6' x 307	320	1840	600	81	351	30.83	20
No. 3, Gray	Gates	Standard Revised	9' x 300	300	1600	605	55	220	—	—
		Experimental Polymer No. 2 (X-601 Non-Stain)								
S-285-363	Mine Safety	Mine Safety	7' x 320	164	2260	858	45	190	7.08	—
			Oven Aged 7 Days at 158°F.							
SC-1752	Acushnet	Acushnet		280	1800	700	—	135	—	—
D-10428-A	Monsanto	Industrial		970	1719	279	60	130	—	—
D-10428-B	Monsanto	Industrial Revised		812	1769	316	58	142	—	—
1-PB-599	Phillips	Bond		350	2233	560	50	149	—	—
———	United Carbon	Sun		500	1500	390	54	291	—	—
No. 3, Gray	Gates	Standard Revised		525	1250	400	62	120	—	—
		Experimental Polymer No. 2 (X-601 Non-Stain)								
S-285-363	Mine Safety	Mine Safety		222	2117	750	52	183	—	—
			Oxygen Bomb 48 Hours at 80°C., 50 lb. Pressure							
SC-1752	Acushnet	Acushnet		275	2085	750	—	137	—	—
D-10428-A	Monsanto	Industrial		786	1876	361	55	133	—	—
D-10428-B	Monsanto	Industrial Revised		734	2148	465	56	181	—	—
1-PB-599	Phillips	Bond		—	—	—	—	—	—	—
———	United Carbon	Sun		360	1800	560	70	364	—	—
No. 3, Gray	Gates	Standard Revised		460	1075	400	61	110	—	—
		Experimental Polymer No. 2 (X-601 Non-Stain)								
S-285-363	Mine Safety	Mine Safety		188	2090	800	50	164	—	—

Compounds Using GR-S-101 and X-580
(Table X, Figures 15 and 16)

GR-S-X-580 is a masterbatch of 50 parts Philblack 0 on 100 parts of GR-S-101. Excellent physical properties are shown by all compounds, considering the low hardness range. The two best compounds in this group are 5-D-78 and M-39212. Compound 5-D-78 would be preferred due to superior low temperature flexibility (Table XIV).

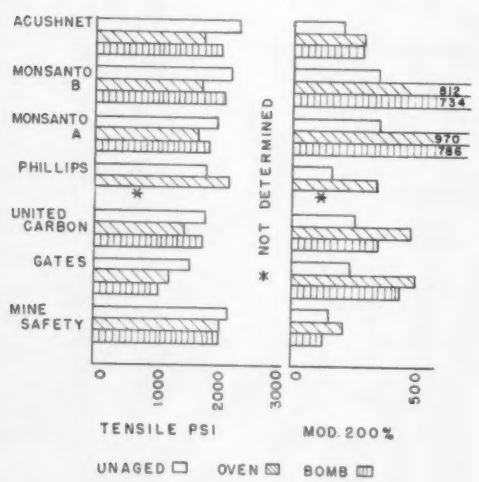


FIG. 19—GR-S X-601.

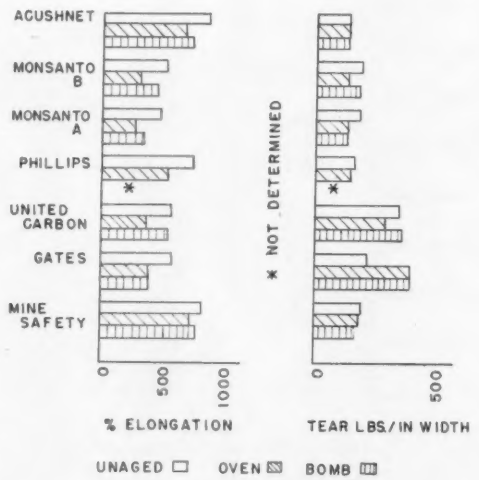


FIG. 20—GR-S X-601.

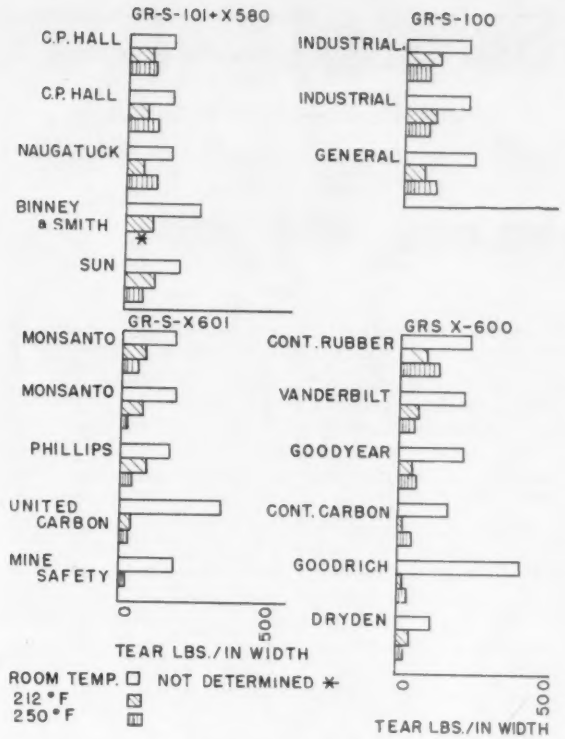


FIG. 21—Hot Tear Tests.

Compounds Using GR-S-X-600

(Table XI, Figures 17 and 18)

Continental Carbon, Continental Rubber, Goodyear and Vanderbilt gave compounds with superior physical properties before and after aging. The Continental Rubber compound gives the best hot tear resistance.

Various Compounds Using GR-S-X-601

(Table XII, Figures 19 and 20)

The Mine Safety and Acushnet formulations are selected as the best in this group. These compounds do not give the increase in modulus at 200 percent elongation shown by the other compounds. The low temperature flexibility characteristics of the X-601 compounds are good. The hot tear resistance of X-601 compounds is not as high as obtained with GR-S-100, GR-S-101 and X-600.

Hot Tear Tests

(Tables IX to XII, Figure 21)

Resistance to tear was measured at room temperature, 212°F. and 250°F. Tear tests at 250°F. were made by the Firestone ring method. These selected GR-S polymers give higher hot tear resistance than Standard GR-S. Hot tear also varies for a given polymer depending upon the compounding ingredients used (Figure 21). Good hot tear was observed with GR-S-100, GR-S-101 and X-580, GR-S-X-600. Hot tear with GR-S-X-601 was not as good as with the other polymers.

TABLE XIII—LOW TEMPERATURE BRITTLENESS TESTS

(1) Thiokol Method—D-736-46-T. Conditioned 5 hours and 96 hours. All samples OK at —40° and —65°F.
(2) Solenoid Method—D-746-44-T. Conditioned 3 minutes. All samples OK at —65°F.

	Company	Code	Polymer	Solenoid Brittle Point—°F. (3)
1	Industrial	FB-31-H	GR-S-100	OK at —97
2	Industrial	FB-32-D	GR-S-100	—97
3	General	13238-M	GR-S-100	—97
4	Mine Safety	S-285-363	Exp. Pol. No. 2	—97
5	Binney & Smith	R-5815.3-8′	GR-S-101 and X-580	OK at —97
6	Binney & Smith	R-5815.1-8′	GR-S-101 and X-580	—87
7	Monsanto	D-10428-B	X-601	OK at —97
8	Monsanto	D-10428-A	X-601	—97
9	Sun Rubber	5-D-78	GR-S-101 and 580	—97
10	Vanderbilt	V-2470-A-14	X-600	—97
11	Dryden	938940	X-600	—97
12	C. P. Hall	X-3765-B	GR-S-101 and X-580	—97
13	C. P. Hall	X-3765-A	GR-S-101 and X-580	—97
14	Goodyear	ST-36-K-20-F	X-600	—97
15	Cont. Carbon	240-1	X-600	OK at —97
16	Cont. Carbon	240-2	X-600	OK at —97
17	Cont. Rubber	82671-F	X-600	—80
18	Cont. Rubber	82671-E	X-600	OK at —97
19	Goodrich	8-ER-2-20	X-600	—94
20	Naugatuck	M-39212	GR-S-101 and X-580	—80
21	Firestone	A-217-N-10	GR-S-100 and X-600	—83
22	Phillips Chem.	1-PB-573	X-478 and X-629	—83
23	Phillips Chem.	1-PB-599	X-601	OK at —97
24	United Carbon	———	X-601	OK at —97

Note: (1) and (2) tested by the V. L. Smithers Laboratories. (3) Tested by the DuPont Rubber Laboratories.

Low Temperature Brittleness Tests

(Table XIII)

The GR-S polymers selected in this study give very low brittleness temperatures. All compounds were OK at —40° and —65° F. when tested by the Thiokol method (D736-46T) after conditioning for 5 and 96 hours at each temperature. There were no failures at —65°F.

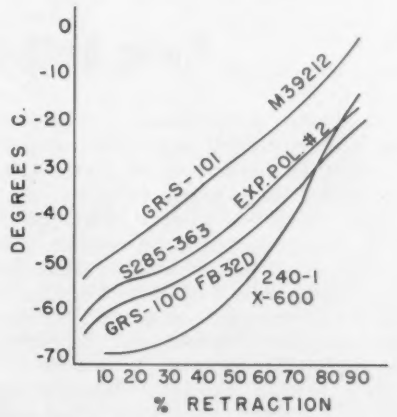


FIG. 22—T-R Curves.

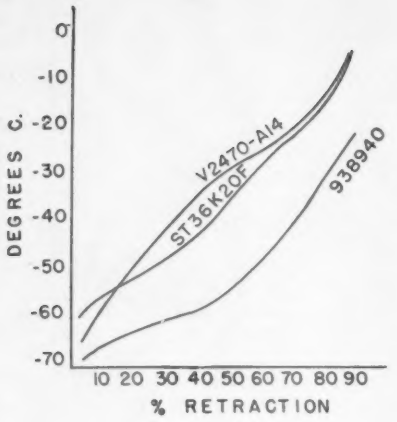


FIG. 23—T-R Curves — X-600.

when tested by the Solenoid method (D746-44T) after conditioning for 3 minutes. The DuPont Rubber Laboratories also determined low temperature brittleness by the Solenoid method. Eight compounds were still OK at —97°F. Two compounds failed at —80° F., two at —83°F., one at —87°F., and the others failed at —97°F. All of these compounds using selected types of GR-S show excellent low temperature brittleness characteristics and are superior in this respect to tests made on a natural rubber faceblank compound.

SUMMARY

1. GR-S compounds with physical properties suitable for a faceblank compound can be made by using LTP polymers.

2. The hot tear resistance of these compounds is an improvement over Standard GR-S.

3. The low temperature brittleness point of these LTP GR-S compounds is highly satisfactory.

4. GR-S compounds with a high degree of flexibility at low temperatures can be made.

5. Pilot plant production indicates that a satisfactory GR-S faceblank can be made.

6. The results of this study are finding application in many other fields.

TABLE XIV—LOW TEMPERATURE FLEXIBILITY
T-R TEST

(Tested by General Tire & Rubber Co.)

Company	Compound	Polymer	% Retraction —40° C.	—50° C.	—60° C.
		Excellent			
Cont. Carbon	240-1	X-600	70	59	42
Dryden	938940	X-600	70	60	30
		Good			
United Carbon	———	X-601	49	37	22
Industrial	FB-31-H	GR-S-100	64	50	13
Industrial	FB-32-D	GR-S-100	60	40	8
Monsanto	D-10428-A	X-601	55	38	5
Monsanto	D-10428-B	X-601	52	35	7
Binney & Smith	R-5815.3	X-P 138	71	60	25
Phillips Chem.	1-PB-599	X-601	49	30	8
		Fair			
Firestone	A-217N-10	GR-S-100	53	15	—
Binney & Smith	R-5815.1	GR-S-101 and X-580	67	46	8
C. P. Hall Co.	X-3765-A	GR-S-101 and X-580	64	33	4
C. P. Hall Co.	X-3765-B	GR-S-101 and X-580	64	33	4
Sun Rubber	5-D-78	GR-S-101 and X-580	62	42	8
Cont. Carbon	240-2	X-600	43	33	21
Cont. Rubber	82671-E	X-600	47	32	8
Goodrich	8-ER-2-20	X-600	46	21	3
Mine Safety	S-285-363	Exp. Pol. No. 2	53	27	4
Phillips Chem.	1-PB-573	X-478 and X-629	45	15	—
		Poor			
General	13238-M	GR-S-100	42	10	—
Naugatuck	M-39212	GR-S-101	26	6	—
Cont. Rubber	82671-F	GR-S-10	26	8	—
Goodyear	ST-36-K-20-F	X-600	47	22	2
Vanderbilt	V-2470-A-14	X-600	30	17	7

ACKNOWLEDGMENT

The authors wish to thank the Chemical Corps for permission to publish this paper, which was made possible by the hearty cooperation of the rubber manufacturers and suppliers of materials to the rubber industry. This study is an example of a cooperative program between Industry and the Chemical Corps carried to a conclusion in a minimum time.

Printing Quality Improved with Hycar-Treated Paper

ITEMS as diverse as ice cream and grass seed can now be packaged with more colorful sales appeal thanks to another application of Hycar latex. Used to coat the packaging paper prior to wax application the latex binds the mineral fillers in the paper. This creates a superior printing surface, resulting in brighter colors and better detailed designs. In the case of foodstuffs, the addition of the latex to the surface of the paper improves the moisture resistance of the package, keeping the contents fresh longer. No odor or taste is imparted to the food.

According to the Waxide Paper Company of Kansas City, Missouri, one of the chief users of the process, the Hycar nitrile latex coating on their paper has resulted not only in finished packages of improved appearance but also in substantial savings in ink. The coating overcomes the paper's blotter-like tendencies. Ink stays on the surface rather than "wicking" into the paper.

Another plus quality is the improvement in flexibility of the paper. This becomes important in the wrapping machine operation where flexibility is a desired property. The latex coating also provides an excellent medium for dispersing the titanium oxide in the paper, giving maximum opacity and whiteness to the sheet. It is expected this coated paper will find wide acceptance in the printing trade for high-quality reproductions.

Rubber and Plastic Foams

A Panel Discussion Held at a Joint Meeting of the Akron Rubber Group and SPE Cleveland-Akron Section

THE joint meeting of the Akron Rubber Group and the Cleveland-Akron Section of the Society of Plastics Engineers which was held in Akron, Ohio, on October 22, 1954, featured a Symposium on "Rubber and Plastic Foams." The Symposium consisted of the presentation of several short papers on various types of foams, including two papers representing the consumer point of view. The final portion of the Symposium was devoted to an extensive question-and-answer period.

Dr. John N. Street (Firestone) acted as moderator for the panel discussion and the various types of foam were discussed by the following panel members: *Latex Foam Rubber*—T. H. Rogers (Goodyear); *Polyvinyl Chloride Foams*—William E. Manring (Goodrich Chemical); *Polyurethane Foams*—W. H. Ayscue (DuPont Elastomers Division); *Polystyrene Foams*—William Schock (Dow Chemical); *Phenolic Resin Foams*—Robert Courtney (Bakelite). The application of foams in the furniture industry was discussed by R. A. Maurer of the Kenmar Manufacturing Co. and applications in the automotive field by H. Beckerlag of the Fisher Body Division of the General Motors Corporation.

An extremely large number of questions was submitted to the panel and the program committee took the liberty of sorting out the questions and rewording them where necessary to make for better presentation. The questions were divided into *basic* and *specific* categories and were handled in this manner during the question-and-answer period. Both the arrangement of the papers and the questions-and-answers have been edited for publication purpose. They follow herewith.

Latex Foam Rubber

By T. H. ROGERS

Goodyear Tire & Rubber Co., Akron, Ohio

UNTIL just a relatively few months ago, the latex foam industry ruled supreme. A few people, not too well versed in terminology, frequently referred to it as sponge rubber, but all knew well what was meant. The luxurious furniture cushions that immediately popped back into shape to the great delight of the housewife, the automobile cushions that defied the constant use and abuse and lasted longer than the car, the ladies' dainty uplifts, these were just a few of the products consisting of latex foam rubber.

And then, it almost seems as if it happened overnight, two newcomers came galloping over the horizon to challenge the supremacy of latex foam rubber. Violent charges were made and are still being made. These new products could be produced at a lower cost; they had a greater degree of non-inflammability; they were better in aging, and in short, whatever latex foam could do, they could do it better. From all the excitement and noise, one would think that the death knell had sounded for latex foam. How many months, how many days were left? Unlike Mark Antony in Shakespeare's great drama, I come to praise Caesar not to bury him, and while I am praising this Caesar, I am completely familiar with the other characters in this plot for I have worked with them in the laboratory.

In order to minimize the confusion that usually accompanies any discussion on the subject of latex foam rubber, it is perhaps better that we first define our terminology. The cellular elastomeric materials, which may be considered as a generic term, broadly include those products which contain cells, or small hollow receptacles, and these products are capable of being elongated or compressed to a certain degree and will return to their original phase when the force is released. Included under cellular elastomeric materials are latex foam rubber, sponge rubber, expanded rubber, flexible expanded plastics, and a host of other materials.

Latex foam rubber consists of a network of open and interconnected cells and, as the name implies, is made by a foamed latex process. From the art disclosed in the patent literature, there appear to be several processes for making latex foam rubber. In actual practice, there are two essentially different processes used. One is the Dunlop method and the other the hydrogen peroxide freezing method, usually referred to as the Tallalay process.

With some few exceptions, the Dunlop method (and variations of it) is used by most of the latex foam producers. This process consists of introducing air into the liquid latex system and the particles of rubber are distributed around the bubbles. The mass is gelled, either by reduction of pH with an acid salt, such as sodium silicofluoride, or by precipitation of a very fine particle-sized mass, which results in a large increase in the specific surface and a subsequent destabilization and gellation of the rubber particles by the resultant paucity of soap in the system. With rubber particles, the cohesion of one particle to another is very great and a tough film around the bubble is thus formed. With a further decrease of pH, brought about by the continued solublization of the sodium silicofluoride, the soap itself is decomposed to its fatty acid constituents, and a

gradual shrinking takes place. This can readily be observed by putting the ear to the surface of the foam where crackling and popping sounds can be heard. The foam is then ready for curing, washing, drying, and finally, trimming.

The Tallalay process consists of incorporating into the compounded latex, hydrogen peroxide and a catalyst, which activates the decomposition of the hydrogen peroxide. The latex is poured, and after the foaming is completed, the mass is frozen, which results in a partial breakdown of the bubbles. Carbon dioxide is then passed through the frozen mass which results in a firm, gelled structure. Vulcanization, washing and drying are handled in much the same way as in the Dunlop process.

When one discusses physical properties of foam, as used primarily for cushioning purposes, the most essential characteristic to first consider is that of compression. A foam may have good feel, high stress-strain properties, and the most beautiful cellular structure ever made by man, but if the compression per unit density is too low, it is uneconomical to produce. In the case of latex foam rubber, the compression is increased by increasing the quantity of rubber and decreasing the volume of air. Some progress has been made in increasing the compression of latex foam by the use of resin latices, fillers, and some reinforcing agents.

Long Term Aging Life

Next to compression, the most important characteristic to consider is the long term aging life of the foam elastomer. When properly used for cushioning, which means that the cushion has to be covered in order to reduce and eliminate light, latex foam rubber gives very good service. Several of the first mattresses which were produced in 1936 are still giving good service eighteen years later. With the improvements in antioxidents in compounding, the currently produced foam should be even better in long term aging. Accelerated long term aging tests confirm this.

Latex foam rubber exhibits a constant increase in compression as the deflection is increased. This is one of the characteristics that make it such an ideal cushioning medium for the human body. All parts in contact with the surface are given support and the weight is not concentrated on any one spot. Latex foam rubber is unique in this respect. The inter-connected cellular structure of latex foam rubber enhances the breathing and moisture elimination of the body coming in contact with it. This property has undoubtedly been the biggest factor in its universal acceptance as a cushioning medium. All one has to do is cover a foam rubber cushion with a moisture- and gas-impervious material, such as a vinyl or rubber sheet, and he will soon feel the discomfort to the body arising from the sealing off from the porous surface.

Latex foam rubber exhibits a high degree of fungicidal and bactericidal properties. Professor Christenson at the University of Minnesota has established that foam rubber used in furniture was 2700% better than kapok and over 3 million percent better than cotton in bacteria contamination. This test was done with seats that were already in service for a certain period of time.

The flex life of latex foam rubber surpasses any other cushioning material. After one million flexes, the foam rubber cushion, properly designed, will lose less than 20% of its original compression, and its dimensions will hardly be changed at all.

The stress-strain characteristics, which are sometimes referred to as the quality properties, vary depending on the natural and synthetic rubber ratio and the density of the stock. Elongations of 450% and tensile strength of 30 pounds per square inch are not uncommon. The low temperature properties of latex foam rubber are excellent. This is one property which some of the newer foams will have to improve if they are to be successful in cushioning applications.

Like all rubber products, latex foam rubber swells when brought in contact with solvents of the aliphatic or aromatic type. This swelling immediately disappears and the foam rubber returns to normal size when the solvent is removed. Alcohol and similar materials do not affect it.

Latex foam rubber exhibits excellent resiliency properties, being in the order of 400 to 500% better than the vinyl and polyester isocyanate foams.

The compression set of latex foam rubber is very good. After being compressed at 158° F. for 22 hours to one-half its original size, the foam will recover to almost 95% of its original thickness. This test is an accelerated method of determining how much a cushion will change in thickness during use. Other types of foam, especially the vinyl foams, are very bad in this respect.

Latex foam rubber burns, and this represents one of its serious weaknesses for certain specialized types of application. For most cushioning applications, such as automotive cushioning, home use, etc., this is no disadvantage. After all, wood burns quite readily and it is still the main staple used in building homes. Cotton also is very inflammable and it represents the greatest quantity of fabric used in clothing. The newcomers in the foam family have better non-flammability, and in these specialized applications they should fit into the picture very nicely.

The latex foam industry has been one of almost continual expansion since its beginning in the middle '30s. It progressed from an 18 million pound business for the best prewar year to over 160 million pounds in 1953. It weathered the abnormally high natural rubber latex price situation in 1950, brought about jointly by the Korean War and the Government's stockpiling efforts during that period. Based on market distribution of latex foam rubber in the year 1950, automotive use accounted for 45%, furniture and miscellaneous applications for 25%, mattresses were 17%, public seating used 10%, and pillows accounted for 5%.

Expanding Market Continues

Because of its excellent performance in these applications, the market for this amazing material continues to expand. Just as cotton still remains king even with the amazing discoveries of rayon, nylon, Dacron, and a host of other fibers, so latex foam rubber will continue to reign in its field. The newer type foam materials have some properties that make them better suited to certain applications and there is an excellent possibility that they will grow to substantial volume. In the beginning, starting from practically nothing, their growth will be very rapid.

However, in this country of ours and in this world of ours, there is tremendous room for expansion for all worthwhile products. As a recent sign of the times, we find that Western Germany, which may be considered the midwife of the polyester isocyanate foam developments, has just installed latex handling facilities at the port of Hamburg to take care of its increasing latex foam business.

Polyvinyl Chloride Foams and Sponge

By WILLIAM E. MANRING

B. F. Goodrich Chemical Co., Cleveland, Ohio

THE subject of this symposium is indeed a timely one, for rubber and plastic foams, at least in the area of flexible, soft products, are under searching commercial and technical scrutiny. The question to be answered is: Do the newer vinyl and polyester-isocyanate foams offer a serious commercial challenge to foam rubber latex? Token investments in research and development time and in capital equipment are being made to uncover reliable information about the practicality of the newer products and their processing, and in many instances the expenditures have gone well beyond the token stage. There is enough presumptive evidence in to encourage the belief that the vinyl and the isocyanate foams will create their own markets, based on their inherent properties.

I will restrict my remarks to the expanded, cellular polyvinyl products, first reviewing briefly the methods used to make them, indicating the nature of the products, and then summarizing the position each type of expanded polyvinyl chloride occupies in relation to the others.

Pertinent Terminology

We have generally adopted the arbitrary terminology which defines closed cell or unicellular expanded polyvinyl chloride as "sponge" and open or interconnecting cell polyvinyl chloride products as "foam."

Closed cell vinyl is a well established product offered commercially in degrees of firmness ranging from soft to rigid. It has enjoyed a modest but distinctive market where the unusual combination of properties afforded by the expanded plasticized vinyl chloride polymer has been peculiarly valuable. Those properties include light unit weight, chemical and oil resistance, toughness, good age resistance, insulation value, and optional non-flammability. Applications have included fish-net floats and buoys, life-saving equipment, industrial uses where contact with chemicals and fuels is encountered, and electrical applications where permeability to X-rays is necessary.

Closed Cell Vinyl Sponge

Closed cell vinyl sponge is made by dispersing a chemical blowing agent in a vinyl resin-plasticizer-stabilizer mixture. In its commonest form, the vinyl resin-plasticizer system will be a so-called plastisol, a fluid dispersion of fine particle size resin in a plasticizer medium, prepared by stir-in or ink-mill techniques. In the case of firmer sponges, either solid plasticizers or low ratios of liquid plasticizer will be used, and hot mill mixing is used to prepare a homogeneous dispersion, due regard being paid to maintaining a temperature under the minimum decomposition temperature of the blowing agent.

The dispersion in either case is fed into a mold, which is then closed and the composition expanded by decomposing the blowing agent at a temperature usually above 300°F. in a suitable press to counterbalance the pressure developed. The mold is cooled, still in the press, under pressure to below 200°F. The green sponge article is then discharged and finally expanded in an oven at about 210°F. The blowing agents are organic nitrogen compounds, characteristically nitroso, hydrazide or azo derivatives, and the blowing action of course results from release of nitrogen during the fusion cycle.

Elastomer Chemical Process

Contrasted to this process is one currently receiving wide attention, the broad details of which are disclosed in U. S. Patent 2,666,036 issued to Elastomer Chemical Corporation. The substance of this method is that an inert gas is injected into a fluid dispersion of vinyl resin in plasticizer, and the mass discharged in a foamed state at a temperature under the gelling temperature of the composition. In practice, the expanded wet plastisol is then fused at a temperature in excess of 300°F., usually in a dielectric field. Characteristically, this process produces open-celled or foam polyvinyl compositions.

Intermediate in a sense between the two preceding examples is a current method fostered by DuPont which employs a chemical blowing agent and a supplement to produce foam or interconnecting cell polyvinyl chloride compositions at atmospheric pressure. Fluid dispersions of resin in plasticizer are employed in this process. Recent advances have removed the early restriction to polymeric plasticizer systems, and conventional monomerics may be used. For optimum results, practice of this process demands a two-stage blowing operation wherein initial expansion at a temperature under the gelation temperature of the plastisol is followed by full fusion at 320° to 350°F.

Comparison of Products

In comparing the typical products prepared by the three methods discussed here, it is apparent that they share the excellent chemical resistance, aging properties, outdoor stability, and flame resistance associated with polyvinyl chloride polymers. They differ in physical properties in the sense that the lowest densities (minimum 2-3 lbs./cu. ft.) are attainable in closed cell sponge, whereas the types cured at atmospheric pressures have reached a minimum of 4 lbs./cu. ft. in the case of the Elastomer type of foam, and somewhat above this in the case of the chemically blown type.

Process-wise, it is apparent that the closed mold procedure is by its nature a custom, discontinuous operation, and inherently a premium manufacturing method on this account. By contrast, both of the atmospheric pressure processes offer the prospect of continuous operation. Single stage fusion and expansion by means of four cent carbon dioxide rather than a relatively expensive organic have led us to believe that the Elastomer process offers the most promising method for establishing polyvinyl chloride foam as a bulk product likely to compete in the volume markets.

Isocyanate (Polyurethane) Foams

By WILLIAM H. AYSCUE

Elastomers Division, E. I. du Pont de Nemours & Co., Wilmington, Del.

THE most recent newcomer to the family of foam products is a group of materials commonly referred to as isocyanate (polyurethane) foams. Made by reacting a diisocyanate with a polyfunctional resin, such as an alkyd or polyester, they offer a wide range of properties and almost infinite variety in physical form. Their outstanding characteristics include excellent ozone resistance, as well as good resistance to abrasion, aging, many chemicals, and certain organic solvents.

The chemistry involved in making isocyanate foams is shown in the accompanying diagrams. Figure 1 illustrates the structural formula for toluene-2, 4-diisocyanate, as well as a typical stero-structure of an alkyd resin. The two isocyanate groups, designated "NCO" on the TDI molecule, will react with almost any chemical compound that contains an active hydrogen atom. On the alkyd resin molecule shown schematically in the lower portion of Figure 1 are three hydroxyl groups, each containing an active hydrogen which will unite with the NCO groups in toluene-2, 4-diisocyanate.

Figure 2 shows the TDI and alkyd resin molecules joined together through a urethane linkage. This type of reaction occurs when there is an excess of isocyanate present, shown in the diagram as free NCO, or unreacted isocyanate, at the terminal of each molecule. These free NCO groups will react further with other compounds containing active hydrogen. Water is an ideal material for such further reaction, since it supplies two hydrogens and will both chain-extend and cross-link these molecules. At the same time, reaction with water liberates carbon dioxide, and if the gas is trapped in the mass it will act as a blowing agent and produce foam.

Figure 3 shows two molecules of a toluene diisocyanate-alkyd resin reaction product tied together at one point through a urea linkage that formed on reaction with water. The carbon dioxide liberated is shown in the lower right corner of the diagram.

While the foregoing chemistry has been greatly simplified for purposes of this discussion, it serves to illustrate the types of reactions that take place in making isocyanate foams.

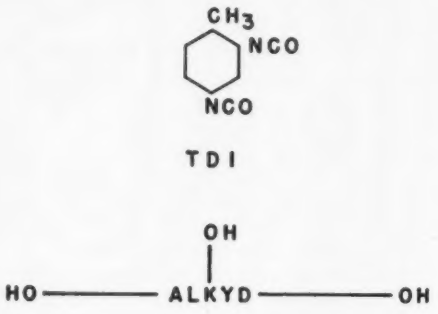


Figure 2

The distance between the reaction sites governs the type of foam produced. For simplicity, this distance may be referred to in molecular weight units. If a low molecular weight tri-functional polyester is reacted with a diisocyanate these distances are quite short and a brittle, friable foam will result. A semi-rigid foam which has high strength and low elongation results from reacting a somewhat higher molecular weight polyester with a diisocyanate. By further changing the polyester to increase the distance between cross-linking sites, a soft, flexible foam may be made. The density of the foam may be controlled through a wide range by varying the amounts of diisocyanate and water used.

In making isocyanate foams, the isocyanate, alkyd resin, water and catalyst may be mixed in one step and the two chemical reactions shown in Figures 2 and 3 carried out simultaneously. An alternate method is to first react the isocyanate with the alkyd resin under controlled conditions to give an isocyanate-terminated compound; water and catalyst are then added to this compound to produce blowing and setting.

One advantage of the two-stage method is that part of the heat of reaction is dissipated prior to foaming. This permits better control, particularly of foam density and cell structure. Another advantage is that it reduces

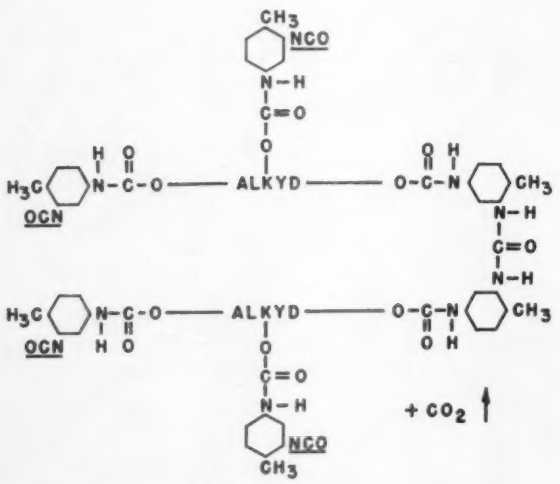


Figure 1

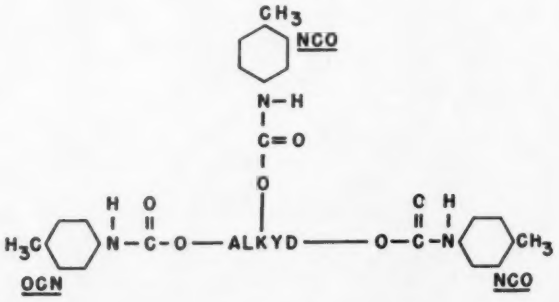


Figure 3

the hazard of exposure to isocyanate vapors during the foaming operation.

Isocyanate reactions call for careful control of raw materials and reaction conditions. For instance, a delicate balance in rate of reaction is necessary because, as shown in Figure 3, polymer formation and evolution of the gas occur simultaneously. The polymer should form rapidly enough to trap the gas in small bubbles as it is evolved. If the reaction is too slow, gas is lost and a poor foam will result. If, on the other hand, the reaction is too fast, the gas forms large voids that show up in the finished product as splits or large holes. Chemicals to be reacted must therefore be introduced in exact proportions.

The amount of water is also critical, so its presence in any of the raw materials, even in traces, must be known and compensated for in the recipe. This means, too, that all ingredients must be protected from moisture in handling.

Another important consideration in working with isocyanates is toxicity. Toluene diisocyanate, which appears to be the most attractive isocyanate from the standpoint of availability, performance, and cost, is a lachrymator. It will also cause dermatitis in contact with the skin, and its vapors irritate the respiratory tract, sometimes bringing on a temporary asthmatic condition which can be quite severe. For this reason, DuPont's medical division requires the company's laboratories to hold isocyanate vapor concentration below one-tenth part in a million, which requires constant care and vigilance to maintain. Preliminary toxicological tests indicate, however, that once an isocyanate has been reacted chemically, as in making foams, the end product is probably no more toxic than other foam materials.

The isocyanates and alkyd resins can be considered chemical building blocks, with which the chemist can turn architect and literally design an almost limitless variety of new products, each with its own set of physical properties. The field of applications for isocyanate foams is still in its infancy. The foams are new today, and have not yet been completely evaluated by potential users. But the science of chemical architecture is making fast progress, and the infant is most certainly destined to grow.

Polystyrene Foams

By WILLIAM SCHOCK

Dow Chemical Co., Midland, Michigan

POLYSTYRENE expanded by the Dow Chemical Co. is best known under its trademark Styrofoam. I shall thus refer to it throughout this discussion. It is made by melting polystyrene granules and mixing them with a blowing agent under pressure. This mixture is released into a normal atmosphere at which time the blowing agent expands the polystyrene approximately 40 times and cools it into a rigid structure having a closed cell system.

Styrofoam is produced in three forms—logs, rough planks and boards. Logs measuring approximately 25 inches x 33 inches x 9 feet, and weighing about 85 pounds, are used by fabricators to produce large cross-sections. Rough planks, either 5 inches x 15 inches x 9 feet long or 7 inches x 20 inches x 9 feet long are also available. Boards ranging in thickness from one inch through 5 inches, in widths of 10, 12 and 16 inches and 9 foot lengths are produced. The 3 foot lengths are packaged in cartons containing 120 board feet each, while the 9 foot lengths are shipped unpackaged in full carloads or truckloads only.

Styrofoam boards are available in two formulations. Styrofoam 22 is white in color while Styrofoam 33 is tinted blue. Styrofoam 33 is classed as a self-extinguishing plastic under conditions of ASTM Test D-635-44, while Styrofoam 22 will burn at the rate of 7 to 8 inches per minute under conditions of the same test. Styrofoam 22 will withstand continuous exposure to temperatures up to 175°F., while Styrofoam 33 will stand temperatures up to 155°F. Log form Styrofoam ranges in density from 1.3 to 1.7 lbs./ft.^{3}. Its cell size ranges from 0.8 to 2.5 and its minimum compressive strength is 10 lbs./sq. in. Rough plank and board form Styrofoam ranges in density from .5 to 1.5 mm and the minimum compressive strength is 16 lbs./sq. in.

Thermal conductivity of Styrofoam is .26 BTU/hr./ft.^{2}/in./°F. at a mean temperature of 50°F. and is .13 BTU/hr./ft.^{2}/in./°F. at a mean temperature of —240°F. All forms are resistant to water and water vapor, as is the parent material, and it has no capillarity because of the closed cell system of the foam.

In addition, higher density Styrofoam is now available in developmental quantities. One product has a density of 3 lbs./ft.^{3} and another a density of 4.5 lbs./ft.^{3}. As might be expected, these higher density foams have smaller cells, higher compressive strengths and slightly better "K" factors.

Styrofoam is quickly and easily fabricated by power or hand-operated cutting tools and by means of electrically-heated wire. It can be heat-formed in low cost dies.

Styrofoam is a versatile material and the properties mentioned above fit this expanded polystyrene for use in many and varied applications. It is used as a buoyancy medium in boats, rafts, docks, surf boards, etc.; in the display field because of its clean appearance and because it cuts so easily the artist can solidify his ideas before they escape; by florists as a base for wreaths, sprays, etc.; to produce novelties that are especially common at Christmas time; as an insulating and shock absorbing packaging material; as a core in sandwich panels having skins of metal, wood, concrete and plastics; for low temperature insulation because it combines more of the most desirable properties than can be found in any other material; to insulate low temperature rooms and vehicles, including trucks, trailers, refrigerated box cars and boats, appliances, process equipment and pipe lines, and in residential insulation as perimeter insulation and as a combined insulation-plaster base in solid masonry buildings.

The diverse large volume end uses mentioned above, plus some others now under development, enable Styrofoam to sell at its present price of 55 cents per pound in carload lots. Board form material is priced competitively with such materials as cork board. It is sold volumetrically, that is, by the board foot. Prices range from 11½ to 18 cents per board foot, depending on quantity and formulation.

Phenolic Resin Foams

By ROBERT COURTNEY

Bakelite Co., Division of Union Carbide & Carbon Corp., New York, N. Y.

PHENOLIC resin foams are so new and yet so old. Our concept of these foams as something useful is new, and we have a great deal yet to learn about them, but they are as old as our experience with the phenol formaldehyde reaction.

Bakelin's great invention covered by his heat and pressure patent was simply a way to tame phenolic foams. Prior to that, chemists had been unable to control this reaction. The ingredients had foamed and hardened into an unusable mass. Resin chemists have struggled ever since to control their reactions and avoid this end result. Somewhere, sometime along the line, some bright lad decided to make a virtue of necessity. Instead of suppressing the foam with back pressure, he encouraged it and attempted to control its density, texture, and uniformity.

How? Just what happens during phenolic resin foaming? When phenol and formaldehyde react together, a condensation occurs, resulting in the release of a molecule of water at every point of reaction. The reaction is exothermic—heat is liberated as the ingredients react and the tempertaure of the mixture rises. So we have all we need for a blow-up, water and heat, steam, pressure and expansion. These two things, water and heat, supplement each other. As is well known, when phenol and formaldehyde react, a resin is formed at first of a syrupy consistency becoming more and more viscous as heating continues until the material gels and hardens.

Second Effect Described

The second effect is the liberation of water, vaporization of the water, and the expansion of its vapor as heating continues. As the vapor expands, both its pressure and temperature are reduced. Eventually, the system reaches equilibrium when the pressure of the expanding steam is balanced by the resistance to deformation of the thickening resin. At the instant when the temperature of the system rises above the temperature of the ambient air, radiation begins and continues until the reaction is finished and the system has cooled to an ambient temperature again. So, somewhere near the time when equilibrium between steam pressure and viscosity is reached, the system also reaches a peak in the evolution of heat and the temperature begins to fall. If at that time the resin has gelled and hardened so as to resist collapse, the cooling foam will retain its approximate size and shape.

From this it is quite apparent that to produce foam of the lowest density we need to start with a resin of low viscosity in order that it can expand rapidly. The system must have great reactivity so that it will expand rapidly and it will gel and harden rapidly so as not to collapse as it cools. To produce foam of the lowest density, we need a resin system of low viscosity and a reactivity approaching as close as possible to explosive violence. We've had some of them reach it.

For heavier densities, we start with more viscous and less reactive resins. The viscosity is regulated in the manufacture of the resin and the reactivity by both the basic structure and the choice of foaming catalysts. Expansion can be assisted by incorporating other ingredients which give off gases or vapors by the action of heat, such as organic liquids, or by decomposition agents, such as the carbonates.

Several ways have been considered for using this phenolic resin foam. The one which occurs first to most people is the foam-in-place procedure. It's such a beautiful day-dream, for example, to think of mixing together measured amounts of two liquids, pouring the mixture into the space between lath and sheathing of a stud wall, and having it foam up like the head of a schooner of brew to fill the entire space uniformly with a fine grade of heat insulation. But don't let these daydreams mislead you. Except under well-managed factory conditions, this foaming process is very hard to control. If you want to make a phenolic resin foam of low density (and high densities of course are more expensive) the whole operation takes place at reaction speeds requiring split second timing and therefore, except in large simple shapes, the expansion is impractical and non-uniform, leaving large voids and dense spots.

In commercial operation, while producing batch after batch of uniform product, it has proved practicable to manufacture this product in large approximately cubically-shaped pieces. Commercial sizes have ranged from 60 to 150 cubic feet. Production rates have been as high as 5000 cubic feet per 8 hour day for one unit and two semi-skilled operators. This rate applies to low density foams, above ⅓ pound per cubic foot, which is used for packing material, heat insulation, etc.—a very light material. This product can be cut with a bandsaw, using either a regular saw blade or wavy breadknife-type of blade. It is used as a packing medium and in a higher density medium in floral packing and floral arrangements.

Two-Component System

In order to have reactions proceed as fast as possible when we are ready to produce foam, while at the same time using a liquid resin with reasonable storage life, we use a two-component system which assures both reaction and storage life. We use a liquid one-step phenolic resin which is made with a basic catalyst and contains everything necessary for a reaction to a final hard infusible state. When it is desired to produce foams from such resins, a highly acidic catalyst or accelerator in the right proportions is rapidly mixed with the resin. As soon as the catalyst has been added, the whole process is in the hands of providence. Theoretically, the process would be more efficient the larger the block of foam made at one time, because there always is a thin but appreciably high density, non-cellular material on the surface which represents a loss. Cubical pieces, some 5 feet on a side, have been found to be most readily manufactured and material efficiency for such pieces is good.

All of the foregoing has been more or less a review of old material and data. We now have something in the line of cellular plastics which is new. This is pro-

duced from tiny, hollow plastic bubbles developed first by the Standard Oil Co. of Ohio, and sold under their name of "Microballoons." They were designed to reduce loss by evaporation of crude petroleum stored in cone-roofed tanks. The Bakelite Co. is a licensee to produce and sell Microballoons and, of course, other uses for them have been and are being sought. One such use which immediately suggests itself is as a low density filler for plastics. This use amounts to making a foam or cellular plastic, not by expanding a mass of material into a foam or sponge but by expanding material into separate and discreet bubbles and then bonding them together again. We need another word for something put together this way so we are trying to call such cellular composite foams "Syntactic" for the sake of clarity.

The first Microballoons produced commercially were made of phenolic resin. I believe there are some now on the market made of urea resin, and they may be made from practically any plastic. The Syntactic foam may be stuck together with almost anything which will adhere and dry or harden—glue, dextrin or starch.

It is difficult to make Syntactic phenolic foams of much lower density at this time. It is expected that lower density Microballoons will be commercially available at some later date. The Syntactic method of making cellular plastics represents several quite obvious advantages over the old foaming procedure. Instead of the old method which required split second timing because we were at the mercy of a reaction speed beyond our control, we can now mix Microballoons with a binder or matrix material to dry or harden at almost any rate we choose. This gives enough time to pack the mixture, which is of putty or slurry consistency, in the most intricate spaces, or we can sandwich it between the skin membranes of reinforced plastic or low pressure laminate stock and harden the whole assembly at one time. These putties or doughs before hardening are plastic in nature, that is, they have a decided yield point and can be modeled or shaped and will hold their shape against the force of gravity.

The Microballoons are quite accurately spherical in shape as contrasted with the polyhedral shape of the cells in a true foam. When uniformly loaded, the sphere is of course an ideal engineering structure. Microballoons are all closed cells. About half the phenolic foam as ordinarily made contain connected cells. Other materials added to a foaming mix made in the ordinary manner tend to retard the expansion of the foam. In a Syntactic foam, the expansion is done in advance so other materials, such as glass or other fibers, can be added for reinforcing the structure without changing the degree of expansion in any way.

The economy of using Microballoons in such structures is good. Even though the per pound price of Microballoons may be high because of the low density, a part of given dimensions can be made cheaper as well as lighter if expanded with Microballoons. Conversely, a section may be made thicker and hence stiffer at the same or less cost if expanded with Microballoons.

To summarize: There is a place for both true phenolic foam and Syntactic phenolic foam. The former can be made lighter and cheaper and finds a place in packing applications of various kinds while Syntactic foams are useful for structural applications where a combination of strength and light weight are required. Uses readily suggesting themselves are in sandwich structures, sections requiring greater thickness and stiffness without increasing cost or weight, and sections whose dimensions rather than their strength are predetermined and whose costs can be lowered by expanding the material with Microballoons. I am sure that many other uses will come to mind and I hope that this new approach to the problem of expanded plastics will prove to be palatable food for thought.

Foams in the Automotive Industry

By H. BECKERLAG

Fisher Body Division, General Motors Corp., Detroit, Mich.

AS in all other materials, the use of foam rubbers or foam plastics in automotive applications is controlled by factors of cost versus suitability. Foam rubber products never have been and probably never will be inexpensive, even in volume, and their use is therefore restricted to places where their properties over-rule all other considerations.

Until recently, the only significant application of foam rubber in automobiles has been in upholstery usage where load distribution properties, resilience and durability can be used to advantage in the construction of premium quality seating.

Residual odor is a possible defect of these foams. In some cases where insufficient washing has occurred, the odor is sometimes objectionable. This requires continual vigilance on the part of the foam manufacturers. The reaction of solvents used for cleaning upholstery trim on rubber foam is another potential source of trouble.

The nature of the foam forming process places some limitations on the shapes and sizes available and the tolerances required, but it is much less limited in this respect than expanded cell stocks. We do not have any information yet as to whether other elastomer foams require large dimensional tolerances or what shape limitations exist. As far as rubber foams are concerned, we are using sections as small as 1/16 of an inch thick and as large as three inches. Obviously, with mold cast forms, fairly complex shapes are possible, since the obvious limitations of pressure mold parting lines are eliminated.

The characteristics of foam rubber have not permitted its use in applications where it is exposed directly to weathering and/or wear, such as scuffing or tear. By the application of a protective coating on the surface, however, foam rubber is working out very successfully on our mechanically retained door weatherstrip seals. On this application, the material is being compounded to its best physical properties, that is, comparatively low compression set, high resiliency and low load deflection characteristics. The net result is a very flexible strip which readily follows the body contours, and because of its inherent softness, the closure forces do not cause internal tears at high stress areas.

Another development that has come about because of styling requirements is that of embossed trim. In this use, a cover material such as genuine leather or vinyl-coated fabric is applied over a foam rubber pad and the desired design achieved by means of heat and pressure. This spotlights another property that is required, that of self-adhesion of cell walls to themselves under heat and pressure so that the bond line of the desired design is well defined and securely fastened to the foundation. This usage has great possibilities on interior designs of automobiles. The addition of dielectric heating for this application indicates that there are flashover characteristics to be considered.

Another major use of foam rubber in automobiles today is its application as backing on carpets used for floor covering. It gives a luxurious feel and also permits the carpets to drape over the contours without wrinkling. Such usage is presently limited to premium models.

So far I have confined my remarks to rubber foams, but we must not overlook plastic foams, both of the elastic and rigid types. Such an application is found in arm rest pads. Here, the possibility of combining a plastisol coating with a foamed vinyl and simultaneously curing both was early recognized. Such a pad, having as it does a tough and attractive cover requiring no hand trimming, represents an obvious gain if the other characteristics and costs are favorable.

The vinyl foams do not offer the flexibility at low temperatures that are available with rubber types, but they are quite suitable for some applications. Vinyl plastisols are being developed that will give the desired color retention, grain and plasticizer stability.

The expanding sealers of the foaming type are interesting and might be developed for possible automotive use. The requirements for these materials include placement adjacent to the space to be sealed, with the composition regulated so normal assembly operations through the ovens would furnish enough heat to foam and cure the material in the space desired. Also in the same category, but somewhat further removed for automotive use, is the foamed-in-place plastics, which can be used for structural rigidity.

The last of the foaming materials to be considered, and the most recent to be brought to our attention, are the diisocyanate compounds. The extraordinary physical properties and good aging resistance of both the foam and rigid types make it imperative that industries in general examine this material very closely even though it appears at present that the cost is rather high.

Foams in the Furniture Industry

By R. A. MAURER

Kenmar Manufacturing Co., East Palestine, Ohio

AS a representative of the furniture industry, I am going to qualify my remarks and limit them to the part of the industry of which I have some knowledge. I am sure that many problems of the bedding industry differ from those of the upholstered living room field. It will also be necessary for me to limit my remarks on present usage to that of latex foam, as I know of no major use of plastic foam in our industry as of this time.

Our company is in its second period of latex foam use. The first time was during the middle thirties, following which strong demand disappeared because of relatively high cost in a low price market. The present period shows a much stronger demand and, we believe, in its present form, it will continue to be an important factor in the field. Compared to conventional seating, its greatest advantages are in its comfort and almost complete indestructibility.

Improvements that would make it still more marketable—and here I must ask you to translate into your technical terms the jargon that I find necessary to use include the following:

(1) In molded cushion foam it is desirable to have more resistance to compression laterally and less resistance to compression horizontally. This may sound peculiar, but the two most noticeable complaints are that of cover wrinkling and crawling or moving around the unit, and resistance to compression or too strong a desire for the latex to return to its normal position. The best example of the latter is a foam bed pillow and how, rather than allowing one's head to remain in position, it keeps tossing it back up or to one side.

(2) Improved porosity to allow better circulation of air around the body would also improve this product.

The greatest problem with which we must contend in today's market is the great differential in cost for latex foam over conventional filling materials. We are sure that the volume usage of rubber foam in the upholstered field would increase in relation to its decreasing ratio of material cost to total product cost and I cite the following as an example:

One sofa which we are currently selling both with latex foam cushions and conventional spring cushions, in a base cover retails at $125 with spring cushions and $169 in latex foam cushions. The style is the same, covering the same, construction throughout the same with the exception of the difference in cushions. The dollar differential is $44 or an increase of 35% for the foam rubber cushions. On a sofa that would retail, say at $375, the $44 extra cost would amount only to 12%,—but the volume of business is done at the lower level.

Reduction in this difference would surely not only mean that more foam cushions would be used, but that foam material with the right properties could be used in place of all other filling materials. These properties should include: lack of permanent set; correct porosity at the surface, as well as throughout the material, and correct resistance to compression, keeping in mind the difference in lateral and horizontal compression. Other important factors could be resistance to normal home cleaning fluids and the desirability for a light weight material.

I am aware of some work that is being done in the field of plastic foam and, personally, have high hopes of what will result.

EDITOR'S NOTE: A transcript of the questions and answers which followed the presentation of papers will appear in the June, 1955, issue of RUBBER AGE.

Editorials . . .

Transition Problems

WITH the exception of the GR-S units at Baytown, Texas, and Institute, West Virginia, all of the synthetic rubber plants are now in the hands of private industry The legal transfers started on April 21 with disposition of the Butyl and GR-S units at Baton Rouge to Esso Standard Oil and Copolymer Chemical, respectively, and were completed on April 29 with that of the GR-S units at Port Neches to Goodrich-Gulf Chemicals and Texas-U. S. Chemical, respectively. The Baytown plant will be sold to one of nine bidders, with Congressional approval, within the next 60 to 90 days, while the Institute plant, a high-cost unit, will remain in mothballs for a minimum of three years.

The sale of the synthetic rubber facilities brought a bonanza to banking circles. For the seven-day period ended April 27, business loans of New York banks showed their first increase in several months. The increase was attributed almost in entirety to borrowing from banks by private interests to purchase the synthetic rubber facilities from the government. The increase in commercial loans for the period was $31,000,000, but financial circles reported that the amount loaned by the banks for such purpose was considerably more than that net figure. Although no specific figures are available, it is estimated in some quarters that loans to rubber, petroleum and chemical companies involved in the rubber transactions were in the neighborhood of $53,000,000—and that's a nice neighborhood.

Practically all of the new owners of the copolymer plants, in most cases the previous operators, have announced their sales arrangements and have established specific divisions or departments for such purposes. They have also issued sales price data for the various copolymers they are currently producing, and are already actively soliciting in the field for orders. In most cases the government number designations are being continued (as per the table we published in our last issue) but specific brand names are being utilized. For the most part, these are brand names with which the rubber field is already familiar, so no great difficulty in locating sources of supply is expected. The difficulty lies in the availability of specific copolymers.

This latter point is already proving quite vexing, especially to the smaller consumers of synthetic rubber. At various times the synthetic plants under government ownership were producing as many as sixty different polymers at one and the same time. It is extremely doubtful that anywhere near such a variety will be forthcoming from the now privately-owned plants. There are good and sound economic reasons why a commercial copolymer plant should be limited with regard to the types of synthetic produced. It will take a shakedown period to determine the economics of producing specialty copolymers of any type. In the interim, some changes in compounding may be required to meet the changed—and changing—situation. The new owners of the synthetic plants may be relied upon to do their utmost in this transition period, but special problems will arise and their solution rests with time.

As for the immediate prospects for synthetic rubber, the producers face no particular sales problem, nor should there be any such problem for some time to come. The rubber manufacturing industry, particularly the tire and tube segment, is forging ahead steadily in keeping with the accelerated industrial pace. Estimates for total new rubber consumption for the year of 1955 have already been upped substantially, and it is now expected that the year will see the consumption of at least 1,300,000 long tons. This tonnage is expected to be achieved even if there is a definite dip in the fourth quarter of the year based on a sharp decline in the manufacture and sale of automobiles. The replacement tire market is matching the original equipment market percentagewise and the non-seasonal gains in this field will be reflected in the year-end figures.

With regard to the long-term prospects for synthetic rubber, it is quite obvious from expansion moves already announced by several of the new owners of the present synthetic rubber facilities that they face the future with complete confidence. Firestone, for example, announced a $1,200,000 expansion program covering the two copolymer plants it acquired from the government. Similar announcements were made by others, and it is reasonable to expect that still other expansion plans will be made known shortly. Total new rubber consumption of 1,500,000 long tons per year in the United States can well be expected within the next ten years.

Perhaps of even greater import to the rubber manufacturing industry will be the concentration on research and development which can now be expected where the synthetic rubbers are concerned. We do not mean to imply that there was any laxity on such research and development while the plants were under government ownership, but it is simply good reasoning to predict a step-up in that direction under free, competitive conditions. The end result of such concentration should be new and better copolymers for the industry, which in turn means improved end-products for the ultimate consumer.

Highlights Sidelights *of the News . . .*

May, 1955

The Rubber Producing Facilities Disposal Commission reports that nine bids have been entered for the 44,000 long ton GR-S plant at Baytown, Texas . . . Two of the bids have been placed by companies who succeeded in obtaining other synthetic rubber facilities during original negotiations . . . Meanwhile, the plant will continue operation under the Federal Facilities Corporation until such time as it is sold or placed in standby (page 257).

With the final transfer of the synthetic rubber facilities to private industry, plant purchasers obtained from the FFC inventory certain quantities of GR-S and GR-I as part of their purchases . . . FFC has now announced the types each purchaser secured from inventory so that consumers may know what specific types were secured by whom (pages 257, 258).

Additional details concerning the pending dissolution of the sales arrangement between the Columbian Carbon Co. and Binney & Smith, Inc., have now been made available . . . The exclusive sales contract whereby Binney & Smith represents Columbian Carbon for the sale of the latter company's carbon blacks and iron oxides will be terminated as of June 30, 1955 (page 267).

A House Small Business Subcommittee headed by Representative James Roosevelt (Dem., Calif.) has heard testimony from a Federal Trade Commission attorney alleging that a single oil company received "almost $5,000,000" from two major rubber companies in an eighteen month period in return for its dealers handling certain lines of tires, batteries and accessories . . . The case was said to have been uncovered in an FTC field investigation of alleged "discriminatory practices" on the part of oil and rubber companies in the distribution of TBA products through retail gas stations (page 263).

The 1954 annual report of the Thermoid Co., issued late in April, stated that accounts for the three previous years had been "manipulated" in an attempt to reduce income and excess profits taxes . . . Supplementary notes to the report stated that there was no evidence of anyone in management profiting by the manipulations . . . A stockholders meeting scheduled for May 3 has been postponed for two months by a New Jersey Appellate Court to give stockholders time to study the report . . . In the meantime, an investigation by the Internal Revenue Service and outside auditors continues (page 259).

Several innovations marked the Spring Meeting of the Rubber Division held in Detroit (May 4-6) . . . the presentation of invited papers . . . the establishment of a Best Papers Committee to improve the quality and presentation of papers . . . approval for a division historian . . . In all, a highly successful meeting (page 260).

NEWS REPORTS and Industry Activities

PRIVATE FIRMS TAKE OVER SYNTHETIC PLANTS; NINE BIDS ENTERED FOR BAYTOWN GR-S PLANT

ON April 29, 1955, the last of the synthetic rubber facilities offered for sale by the government passed into private hands. With the exception of the Baytown, Texas, GR-S plant, all of the twenty-seven plants involved in the government synthetic rubber program had either been sold, leased or otherwise accounted for. Sold were eleven GR-S plants, two Butyl plants, eight petroleum-butadiene plants, one alcohol-butadiene plant, one styrene plant and one chemical plant. The Institute, West Va., GR-S plant, in standby since September, 1953, goes into standby for another three years under the terms of the disposal law. Publicker Industries, Inc. of Philadelphia, Penn., has leased the alcohol-butadiene plant at Louisville, Ky.

As for the Baytown plant, on March 31, the President signed legislation authorizing extension of negotiations for sale of this property. The Rubber Producing Facilities Disposal Commission accepted bids for the facility until midnight, April 29, by which time nine firms had entered bids. There then began a 60 day period of negotiations between the bidders and the Disposal Commission. Any contract agreed upon by the Disposal Commission and the successful bidder must be approved by the Attorney General and the Congress. If the Disposal Commission fails to come up with a satisfactory contract, the plant will go into standby for a three-year period.

Names of the nine firms which offered to purchase the Baytown plant were announced as follows: American Resinous Chemicals Corp., Peabody, Mass.; Baytown Rubber & Chemical Corp., Baytown, Texas; Food Machinery & Chemical Corp., New York, N. Y.; General Tire & Rubber Co., Akron, Ohio; Goodyear Synthetic Rubber Corp., Akron, Ohio; Edwin W. Pauley (an individual), Los Angeles, Calif.; Minnesota Mining & Manufacturing Co., St. Paul, Minn.; Thiokol Chemical Corp., Trenton, N. J., and United Carbon Co., Charleston, West Va.

Two Purchasers Also Bid

Two of the bidders, Food Machinery & Chemical and Goodyear Synthetic, were among the successful bidders for other synthetic rubber facilities. Food Machinery & Chemical, in combination with the Tennessee Gas Transmission Corp., bought the government's petroleum-butadiene plant at Houston, Texas, while Goodyear Synthetic took over a 99,600 long ton GR-S plant at Houston and a 15,200 long ton GR-S plant at Akron.

General Tire, the present operator of the 44,000 long ton plant, was the sole bidder for the Baytown plant when the facility was originally put up for sale. The Disposal Commission, however, turned down a General Tire bid of $2,486,448 as too low. When Congress authorized the Disposal Commission to renegotiate for the plants, authority was also given to the Federal Facilities Corporation to continue the plant in operation. Accordingly, on April 15, FFC announced that the plant would continue in operation until it was sold or placed in standby.

FFC stated, however, that during the interim, the plant would produce only GR-S 1600, 1601, 1602 and 1801. It was also stated that orders addressed to FFC for the types of GR-S produced by the Baytown plant should reach FFC no later than the twelfth day of the month preceding the month in which delivery is desired.

In other actions, FFC published a list of the plant purchasers together with the type of synthetic rubber each purchased from FFC as his share of final inventory. This list is published elsewhere in this article. It should be understood, FFC emphasized, that the types of rubber purchased by each purchaser as his share of final inventory, are not necessarily indicative of the types which will be produced and sold by each of the copolymer plant purchasers on a continuing basis.

According to the timetable established by the Disposal Commission, all of the transfers of the twenty-four plants sold during the original negotiation period were accomplished in an eight day period beginning on April 21. On that date, Esso Standard Oil Co. took title to the Butyl rubber plant at Baton Rouge, La., and the Copolymer Rubber & Chemical Corp. took title to the GR-S plant and the petroleum-butadiene plant at Baton Rouge, La. On succeeding days, the following companies took title to the properties noted:

April 22: Firestone Tire & Rubber Co.—the GR-S plant at Lake Charles, La.; Petroleum Chemicals, Inc.—the petroleum-butadiene plant at Lake Charles, La.

April 25: Standard Oil Co. of California—the petroleum-butadiene plant at El Segundo, Calif.; Shell Chemical Corp.—the GR-S plant, the petroleum-butadiene plant and the styrene plant at Los Angeles, Calif.; Great Southern Chemical Corp.—Miscellaneous equipment at Corpus Christi, Texas.

April 26: U. S. Rubber Co.—the GR-S plant at Naugatuck, Conn., and the DDM plant at Naugatuck, Conn.; Firestone Tire & Rubber Co.—the GR-S plant at Akron, Ohio; Goodyear Tire & Rubber Co.—the GR-S plant at Akron, Ohio.

April 27: American Synthetic Rubber Corp.—the GR-S plant at Louisville, Ky.; Koppers Co., Inc.—the alcohol-butadiene plant at Kobuta, Penna.; Phillips Chemical Co.—the GR-S plant at Borger, Texas, and the petroleum-butadiene plant at Borger, Texas.

April 28: Humble Oil & Refining Co.—the Butyl rubber plant at Baytown, Texas, and the petroleum-butadiene plant at Baytown, Texas; Goodyear Synthetic Rubber Corp.—the GR-S plant at Houston, Texas; Food Machinery & Chemical Corp.—the petroleum-butadiene plant at Houston, Texas.

April 29: Goodrich-Gulf Chemicals, Inc.—the GR-S plant at Port Neches, Texas, and undivided half interest in the petroleum-butadiene plant at Port Neches, Texas; Texas-U. S. Chemical Co.—the GR-S plant at Port Neches, Texas, and undivided half interest in the petroleum-butadiene plant at Port Neches, Texas.

It is interesting to note that on May 2, the Disposal Commission came up with a revised figure of $285,832,378 as the total yield from the sale of the twenty-four facilities, their inventories, materials in process, and new additions. This was almost $1,000,000 higher than the $284,991,629 announced on April 29. The revision resulted from tax adjustments, representing accruals and prepaid taxes, the Disposal Commission explained.

Expansion Plans Announced

In an aftermath to the formal signing of documents and the actual take-over of facilities, a number of the purchasers announced plans to expand the facilities they had just purchased. Firestone Tire & Rubber Co., for example, disclosed that it had launched a $1,200,000 expansion and improvement program at the two synthetic rubber producing plants it had purchased from the government.

Company officials stated that improvements being made in the Lake Charles facilities will increase capacity by approximately 13%. At the Akron plant purchased by Firestone, equipment is being converted to increase the output of cold rubber.

In another announcement, Bancroft W. Henderson, president of the American Synthetic Rubber Corp., stated that an expansion program is underway which will provide the company's plant at Louisville, Ky., with new dock and storage facilities. The new docks, he said, will permit delivery of key raw materials from Texas at "substantial savings" in transportation costs.

The expansion program also calls for installation of equipment to produce several polymers in addition to those currently in production. The new dock and storage facilities, Mr. Henderson said, are expected to be completed by September 1, and the additional polymers are expected to be on stream about September 15.

PLANT PURCHASERS AND TYPES OF SYNTHETIC RUBBERS THAT EACH ACQUIRED FROM FINAL FEDERAL FACILITIES CORPORATION INVENTORY

Plant Purchaser	*Location of Synthetic Rubber Plant or Plants Purchased*	*GR-S Types*
American Synthetic Rubber Corp. 370 Lexington Ave. New York 17, N. Y.	Louisville, Ky.	1001, 1004, 1006, 1009, 1010, 1013, 1014, 1016, 1018, 1019, 1021, 1500, 1502, 1503, 1601, 1703, 1708, 1712, 1801.
Copolymer Corp. P. O. Box 1029 Baton Rouge 1, La.	Baton Rouge, La.	1500, 1502, 1505, 2101, 2102.
Firestone Tire & Rubber Co. Akron 17, Ohio	Akron, Ohio, and Lake Charles, La.	1000, 1001, 1002, 1004, 1005, 1006, 1009, 1010, 1012, 1013, 1014, 1015, 1500, 1502, 1703, 1705, 1710, 1712.
Goodrich-Gulf Chemicals, Inc. Gulf Bldg. Pittsburgh 30, Penna.	Port Neches, Texas	1001, 1002, 1006, 1500, 1501, 1502, 1705.
Goodyear Synthetic Rubber Corp. 1144 Market St. Akron 16, Ohio	Akron, Ohio, and Houston, Texas	1000, 1007, 1009, 1012, 1015, 1018, 1100, 1500, 1502, 1503, 1601, 1703, 1707, 1708, 1710, 1712, 1801, 2004.
Phillips Chemical Co. Bartlesville, Okla.	Borger, Texas	1004, 1009, 1010, 1018, 1100, 1503, 1600, 1703, 1706, 1708, 1711, 1712, 1801.
Shell Chemical Corp. RCA Building 30 West 50th St. New York 20, N. Y.	Los Angeles, Calif.	1000, 1001, 1002, 1006, 1009, 1010, 1013, 1018, 1100, 1500, 1501, 1502, 1503, 1600, 1602, 1703, 1705, 1706, 1707, 1708, 1709, 1712, 1801, 2000, 2004.
Texas-U. S. Chemical Co. 135 East 42nd St. New York 17, N. Y.	Port Neches, Texas	1010, 1100, 1505, 1600, 1703, 1707, 1708, 1709, 1711, 1801.
U. S. Rubber Co. 1230 Ave. of the Americas New York 20, N. Y.	Naugatuck, Conn.	1009, 1016, 1018, 1019, 1021, 1022, 1023, 1503, 1504, 2000, 2001, 2002, 2101, 2103, 2104, 2105, 2106, X767.
		GR-I Types
Esso Standard Oil Co. Baton Rouge, La.	Baton Rouge, La.	(a)
Humble Oil & Refining Co. Baytown, Texas	Baytown, Texas	(a)

Note: (a) Enjay Co., Inc., 15 West 51st St., New York 19, N. Y., will be the selling agent for all types of GR-I.

Two New Silastic Stocks

Two new Silastic stocks for extreme low temperature service have been developed by the Dow Corning Corp., Midland, Mich. Identified as "S-2048" and "S-6526", they were designed specifically for aircraft seals and low temperature applications. Silastic S-2048, a 60 durometer stock, is an unmatched combination of flame-resistance, resilience at —130°F., high mechanical strength and easy handling characteristics, the company states. Exposed to 2000°F. for 20 seconds, the stock extinguishes its flame in 30 seconds and shows no significant change in length. Silastic S-6526 is a 50 durometer stock which is said to offer a high degree of resistance to compression set plus excellent handling qualities and flexibility at temperatures down to —130°F. Parts fabricated for low temperature service require only a short cure to obtain optimum physical properties. Both Silastic stocks are white and may be extruded, molded or calendered. Both are available in commercial quantities at prices comparable to those for standard silicone rubbers, the company states.

Nylon Cord Airplane Tire

A new nylon cord airplane tire that is said to give up to 20% more landings than tires now used on the main and nose wheels of large commercial airliners has been announced by the Firestone Tire & Rubber Co., Akron, Ohio. The company states that the new "Sky Champion Gear Grip" tire has a flatter profile, wider ribs and a new tread compound to provide longer wear. Extensive service testing has proved that this new tire delivers up to 20% more landings, Firestone said. The company points out that by widening the ribs at the tire's points of maximum contact with the airport runway and by increasing the overall contact area, Firestone engineers have substantially reduced the rate of wear. Particularly minimized, the company said, is the wear caused by landing, taxiing and turning on highly abrasive runways in current use today.

The new tire also is designed to give greater clearance within wheel nacelles. Skid resistors are built into the new tires to increase their traction and to minimize skid burns. The skid resistors also provide increased resistance to tearing and better traction in landings on wet surfaces, Firestone states. The new tire is made with safety-tensioned, gum-dipped high-strength nylon and incorporates new compounding techniques developed by the company. A new material recently discovered by company scientists has been added to the tires to protect them from attack by fumes and oil and from ozone concentrations encountered under certain atmospheric conditions. The tires are being produced with ply ratings of 10 to 20—depending on the type tire—in the following sizes: 34—9.9, 12:50—16, 15:50—20 and the 44-inch tire. All are nylon cord tires; however, the 15:50—20 is also available with rayon cord, the company advises.

MANIPULATION OF DATA CHARGED IN ANNUAL REPORT OF THERMOID

The formal annual report of operations of the Thermoid Co., Trenton, N. J., for 1954, issued recently, stated that accounts for the three previous years were "manipulated." Notes to the consolidated financial statements of the annual report explained that an examination of company accounts for 1951, 1952 and 1953 showed that the "accounts of the parent company and its subsidiaries during these years were manipulated for the purpose of diverting profits from the parent companies to the subsidiaries (or vice versa), thereby improperly reducing income and excess profits taxes."

The annual report was not signed by any officer of the company but by two directors, Guy George Gabrielson and Meredith C. Jones. A company's annual report is generally signed by the chairman, or the president, or by both officers. Mr. Gabrielson said he and Mr. Jones were requested by the board of directors to sign and issue the report since they had less connection with management than any of the other directors.

The extent of these manipulations by certain members of management and employees of the company and its subsidiaries has not been finally determined, the notes said. However, "such manipulations did not, of themselves, affect the consolidated net income before taxes. These consisted principally of transfers of material without charge, charges for materials when no deliveries were made, incorrectly stating quantities transferred, incorrect pricing, etc." Furthermore, the notes continued, "the manipulations in general were accomplished by the preparation of fictitious and incorrect documents."

Notes to the financial statement indicated that earnings from operations in 1951 were increased $27,223 for omitted inventory and those for 1952 reduced by the same amount. For 1953, the statement of earnings was increased by $208,526, of which $56,508 represented a gain from omitted inventory and $152,018 for excessive write-down of inventory classified as scrap or obsolete.

Mr. Gabrielson said there was no evidence of anyone in management profiting by the manipulations. The purpose of the manipulations, he said, was to reduce taxes. An investigation by the Internal Revenue Service and outside auditors was still in progress to determine the full extent of responsibility, he said.

On May 2, a new Jersey Superior Court Justice ordered a three-month delay in the annual stockholders meeting which was to have begun on May 3. The Justice granted a petition by three stockholders which stated that all stockholders should have time to study the company's annual report. The petition charged that Thermoid might be liable for about $1,500,000 in additional taxes, interest and penalties due to accounting which increased the taxes due from Essex Rubber (a Thermoid subsidiary) and decreased the taxes due from Thermoid. On May 3, the delay in the stockholders meeting was reduced to sixty days by an appellate court decision.

CORNELL AND MILLER NAMED TO EXECUTIVE POSTS AT GOODRICH-GULF

P. W. Cornell

J. E. Miller

P. W. Cornell, formerly assistant manager of the Chemical Department of the Gulf Oil Corp., and a director of Goodrich-Gulf Chemicals, Inc., has been elected vice-president in charge of operations, engineering and development for the latter company. J. E. Miller, previously manager of the copolymer plant at Port Neches, Texas, operated by the B. F. Goodrich Chemical Co., has been named general sales manager for Goodrich-Gulf. A graduate of Rensselaer Polytechnic Institute in 1936 with a degree in chemical engineering, Mr. Cornell started with Gulf in 1941 as a process engineer in the Engineering and Construction Department. In 1948, he was named staff assistant in the Executive Department and in 1953 joined the newly-formed Petrochemical Activities Group as assistant manager. He served in that capacity until he joined the Chemical Department.

Mr. Miller was graduated from Wooster College in 1933 with a B. S. in science, and joined the B. F. Goodrich Co. in Akron as a production worker. He held various supervisory jobs until, in 1942, he was transferred to the Goodrich-operated Lone Star Ordnance Plant at Texarkana, Texas, as auxiliary loading superintendent. In 1943, he was named production engineer at the Port Neches copolymer plant. From 1945 until 1952, he served as plant manager of the Port Neches plant. In 1952, Mr. Miller was loaned to the government for seventeen months to serve as deputy director of the Office of Synthetic Rubber. He returned to Goodrich Chemical in 1953 and assumed the position of defense contract coordinator.

In other news of the company, S. A. Swensrud, chairman of the board of Gulf Oil, has been elected a director of Goodrich-Gulf. The following were re-elected as directors: William I. Burt, P. W. Cornell, L. O. Crockett, John R. Hoover, W. L. Naylor, W. S. Richardson and Frank K. Schoenfeld. Mr. Swensrud has also been elected chairman of the board of Goodrich-Gulf, while Mr. Burt was re-elected president.

Receives NSC Safety Award

B. F. Goodrich Co. has again received the National Safety Council's Award for accident prevention performance. The company's Textile Division, Martha Mills, Silvertown, Ga., also won an Award of Honor. Winners in the National Safety Council Rubber Section safety contest included the company's plant in DuBois, Penna., for the eleventh time; the Research Center, Brecksville, Ohio; the reclaim plant and the works technical laboratories in Akron, and the Port Neches plant of the B. F. Goodrich Chemical Co. Awards of Merit went to the Goodrich Akron plants as a group; to the Footwear and Flooring Division, Watertown, Mass.; the Louisville, Ky., plant of Goodrich Chemical, and the Los Angeles plant of the Tire and Equipment Division.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 323.

Custom Casting Service

Applied Engineering Associates, Brooklyn, N. Y., has announced that it will custom cast multi-component resin mixes such as ethoxylenes, polysulfides, polyamides, foamed phenolics and foamed polyurethanes to produce end products. This new service will be analagous to metal foundry shop operations for the preparation of castings. Applied Engineering Associates will produce finished parts to detailed specifications by a modified injection molding technique, utilizing inexpensive, expendable molds. Production cost analyses can be projected accurately, the company states. Of immediate interest to the electronics field is the availability of cast ethoxylene rod stock for the manufacture of winding bobbins. Electronic embedment can be readily handled, casting while under vacuum to yield superior product characteristics. Pilot and production run facilities are also available to assist organizations in planning their own manufacturing facilities.

RUBBER DIVISION HOLDS ITS 67th MEETING IN DETROIT, MICHIGAN

The Division of Rubber Chemistry of the American Chemical Society held its 67th meeting on May 4, 5 and 6 at the Sheraton-Cadillac Hotel in Detroit, Mich. It was a satisfactory meeting in every respect, and the official registration of 1,032 compared favorably with any previous three-day meeting held by the Division. The Detroit sessions were held apart from the parent society.

The meeting featured the presentation of twenty-six technical papers, two special invitation papers—one on the business end and the other on the educational end of the rubber industry, the regular meeting of the 25-Year Club, a business session, and the divisional banquet. The business session was highlighted by the announcement of the 1955 Goodyear Lecturer and the presentation of nominations for the 1955-56 period.

The technical papers, as usual, ran the gamut of rubber chemistry and technology, and were primarily grouped into three subjects, namely, specialty rubbers, reinforcement and oil-extended rubbers. Following the precedent set in recent years, various officials presided at the different sessions, including John M. Ball (Midwest Rubber Reclaiming), chairman of the division; Arthur E. Juve (Goodrich Research), vice-chairman of the division; J. T. O'Reilly (Ford Motor), chairman of the Local Arrangements Committee, and John W. Snyder (Binney & Smith), director-at-large.

Among topics covered by the technical papers were the testing of tires at arctic temperatures, compounding rubber to prevent surface cracking, developing new elastic parts to meet the demands of faster aircraft, strengthening rubber compositions with mica, measuring the efficiency of new types of rubber for holding air, vulcanization of rubber with dicumyl peroxide, properties and applications of Adiprene B urethane rubber, potentials of alfin polybutadienes, and methods of governing the stability of oil masterbatches. Abstracts of all of the papers presented at the meeting were published in the April, 1955, issue of RUBBER AGE.

In addition to the technical program, the local committee arranged trips to the Chrysler, General Motors, Ford and U. S. Rubber plants and to the Detroit Arsenal. Thursday afternoon, May 5, was left open for these visits, practically all of which attracted substantial attendance. Special entertainment was also provided for the ladies, including a tea, theatre party, and excursions to Greenfield Village and Northland Center.

Details of Business Meeting

The semi-annual business meeting of the Division was held at the tail end of the technical session on Thursday morning, May 5, with Mr. Ball presiding. The chairman revealed that the Executive Committee had selected Dr. R. P. Dinsmore, vice-president of the Goodyear Tire & Rubber Co., as the 1955 Goodyear Lecturer, had approved the establishment of an Office of Historian, had named George Popp (Phillips Chemical) as assistant treasurer of the division, and was preparing the ground for the addition of a Canadian representative on the board of directors. It was also revealed that a Best Papers Committee had been organized.

The nomination of Dr. Dinsmore as 1955 Goodyear Lecturer was made by the Goodyear Lecture Committee in the usual manner and was approved by the Executive Committee. Dr. Dinsmore will present his lecture at the next meeting of the division, which will be held in Philadelphia next November. He will be presented with the Goodyear Medal and the usual honorarium during the same meeting. The medal is awarded to outstanding technologists who have contributed substantially to the progress of rubber chemistry and technology.

Recommendations for the establishment of an Office of Historian were presented by a special committee recently named by Chairman Ball to consider the advisability of such an office. The committee comprised M. E. Lerner (RUBBER AGE), as chairman, H. I. Cramer (Sharples Chemicals), and M. R. Buffington (Lea Fabrics). The office will be appointive, the appointee will be named for a three-year period, and will have access to all of the historical records of the Division. Selection of the initial historian is expected to be made in the near future, and plans call for his first report at the meeting in Philadelphia, Penna.

The selection of Mr. Popp as assistant treasurer, whose election was confirmed by the membership during the business meeting, was made necessary by the fact that Amos Oakleaf (Phillips Chemical), treasurer of the division, has been transferred from Akron to Bartlesville, Oklahoma, and it was felt that there might be occasions where distance would prove a problem. Mr. Popp has been empowered to countersign division checks.

Best Papers Committee

Organization of the Best Papers Committee, consisting of Gus Maassen (Vanderbilt) and Harold Braendle (Columbian Carbon), was something in the way of an experiment. The committee worked out a method for selecting the best paper presented at the Detroit meeting on a three-way basis, namely, oral presentation, visual presentation, and content. All authors were advised in advance of selection plans. Special reviewers were named to hear all papers and were provided with special check sheets furnished by the committee. These check sheets will be furnished to the secretary of the division and will serve as the basis for the selection of the "best" paper.

Once determined, the author (or authors) will be notified and attention to the selection will be called to both the immediate superiors of the winners and the president of the company involved. In addition, publicity will be given to the award in the trade journals. If this trial method proves successful, it will probably be continued at future divisional meetings in the hope that it will serve as a stimulant to better papers and better presentation, both oral and visual.

The Nominating Committee, headed by Seward G. Byam (DuPont) as chairman, presented the following candidates for 1955-56 offices: *Chairman,* Arthur E. Juve (Goodrich Research Center); *Vice-Chairman,* B. S. Garvey (Sharples Chemicals) and D. C. Maddy (Harwick Standard); *Secretary,* Arthur M. Neal, (DuPont); *Treasurer,* George E. Popp (Phillips Chemical). The following nominees were named as directors from various local areas:

Connecticut, G. A. DiNorscia (Goodrich Sponge Products) and C. A. Larson (Whitney Blake); *Detroit,* H. W. Hoerauf (U. S. Rubber) and H. F. Jacober (Baldwin Rubber); *Northern California,* John M. Holloway and Jacob Oser (both of Mare Island Rubber Laboratory); *Philadelphia,* A. J. DiMaggio (Firestone) and G. J. Wyrough (Wyrough & Loser); *Rhode Island,* Walter Blecharczyk (Davol Rubber) and U. J. H. Malo (Crescent); *Southern Ohio,* S. L. Brams (Dayton Chemical Products) and E. N. Cunningham (Precision Rubber Products); *Washington, D.C.,* L. A. Schlueter (American Coke and Chemicals Institute) and R. D. Stiehler (National Bureau of Standards).

Mr. Ball advised that the Executive Committee had approved meeting sites for the next several years, as follows:

Fall, 1955—November 2-4—Bellevue-Stratford Hotel, Philadelphia, Penna.—B. S. Garvey (Sharples Chemicals), chairman.

Spring, 1956—May 16-18—Hotel Cleveland, Cleveland, Ohio.

Fall, 1956—September 19-21—Haddon Hall Hotel, Atlantic City, N. J.

Spring, 1957—May 15-17—Sheraton-Mount Royal Hotel, Montreal, Quebec, Canada. (This will be a joint meeting with the Rubber Chemistry Division of the Chemical Institute of Canada).

Fall, 1957 — September 11-13 — Hotel Commodore, New York, N.Y.

Spring, 1958—May 14-16—Netherlands Plaza Hotel, Cincinnati, Ohio.

Fall, 1958—September 10-12—Sherman Hotel, Chicago, Ill.

Spring, 1959—May 13-15—Hotel Statler, Buffalo, N.Y.

Fall, 1959—September 16-18—Atlantic City, N.J.

Of the nine meetings listed above, four will be held in conjunction with the parent American Chemical Society. These are the two Atlantic City meetings and the New York and Chicago meetings.

Hall of Fame Candidates

Attention was also drawn to the fact that candidates for the Hall of Fame are being considered this year and that once again the name of Charles Goodyear has been advanced. In all, the selectors will consider 209 nominees. Mr. Ball revealed that he had named Dr. Harry L. Fisher (University of Southern California) as chairman of a Hall of Fame Committee to advance the cause of Charles Goodyear and urged members of the rubber industry to espouse this worthy cause.

Before the business session was ended a brief tribute was paid to members who had passed away since the last meeting. These included: R. D. Abbott, G. H. Glade, Jr., G. S. Hiers, T. J. Kerr, G. P. Loomis,

Gladding Price, C. A. Rackus, L. L. Ryden, and H. E. Simmons. The tribute consisted of a minute of silence and a brief eulogy read by Chairman Ball.

Bridgwater Discusses Profits

An innovation was introduced at the Detroit meeting in that two of the total of 28 papers delivered at the technical sessions were specific papers requested by the division chairman. The first of these invitation papers was given by Ernest R. Bridgwater, director of sales, Elastomers Division, E. I. du Pont de Nemours & Co. The title of the paper was "Profits."

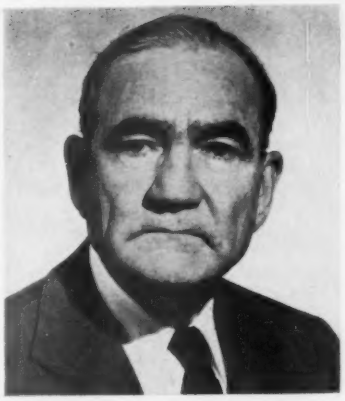
In opening his remarks, Mr. Bridgwater first pointed out that the basic function of a rubber or any other kind of factory is to earn a profit for its owner. Emphasizing that the profit and loss system is one of the most important of our economic institutions, he deplored the fact that there are many well-meaning people in this country who believe that there is actually something wrong about profits. Because of this situation he added that "it is your duty and mine to promote a broader understanding of the function of profits in our economy."

The speaker then discussed some of the ways in which the profit motive influences economic activity. First, he said, it is profitable to produce efficiently, and therefore the profit motive stimulates businessmen to continuously seek more efficient means of producing and distributing goods; second, it is usually more profitable to sell goods which are in great demand than to sell goods for which there is little demand, and therefore the profit motive tends to stimulate the production of goods which are in short supply and to discourage the production of goods which are not wanted; third, profits are usually realized by those who are able to improve existing products or to develop new products for which there is a need, and therefore the profit motive tends to stimulate innovation, research and development.

Mr. Bridgwater then outlined the terms in which profits should be expressed in order to be most meaningful. By using a series of charts he stressed the point that too much attention to profit as a *percentage of sales* may be misleading and that *net returns on investment* are frequently a better criteria. Noting that turnover has just as much influence on return on investment as percentage profit on sales, Mr. Bridgwater indicated that these relationships must be borne in mind in all business decisions.

Turning to the role rubber compounders can play in increasing profits, the speaker outlined several steps. For example, one way the compounder can reduce materials cost is by utilizing lower cost materials without impairing the adequacy of the compound for the service intended. He hazarded the guess that "more than half of the rubber compounds in current use could be made at less cost, without appreciably affecting the serviceability of the product." Citing the high viscosity oil-extensible or oil-extended elastomers as an example, he stated the industry "has not even come close to realizing fully the economies inherent in the use of these elastomers."

According to Mr. Bridgwater, the compounder also exercises some control over processing costs. In this connection he said that rubber chemists have saved millions of dollars in such costs through the use of scorch-resistant accelerators in natural rubber and GR-S and scorch-resistant vulcanizing agents and combinations of agents with neoprene and other elastomers. Further savings, both in processing and materials costs, have been made through the use of highly compatible mineral oils as plasticizers and extenders. He added that the judicious use of chemical peptizing agents has also helped to keep processing costs down.



John M. Ball

Rubber Division Chairman

Finished product inventory is still another operation where the rubber technologist can help defray costs. Although control of such inventory is basically the responsibility of sales departments, cooperation between the compounder and the purchasing agent can be an effective tool. For example, Mr. Bridgwater said, if elastomers and compounding ingredients can be delivered by truck overnight, it eliminates the necessity of storing large quantities of raw materials, and neither capital or warehouse floor space is tied up in inventories. Keeping inventories of this kind at a minimum safe level is of course primarily the responsibility of the purchasing agent, but the chemist can help considerably by selecting raw materials which are promptly available from nearby sources, the speaker declared.

Maximization of Turnover

Finally, Mr. Bridgwater stated, the rubber chemist should strive to maximize turnover by making the kind and quality of products for which his factory equipment is best suited. Presses with small rams and low hydraulic pressure should not be utilized for O-rings and other close tolerance products. On the other hand, if the equipment is suitable for the manufacture of high quality products made from premium-priced elastomers involving difficult manufacturing processes and close dimensional tolerances, that kind of business should be built. Such business permits a high turnover; that is, the ratio of sales to investment is high. The profit on sales is usually at least as high as on cheaper goods, the speaker said, and consequently the return on investment is higher.

Paper on Educational Activities

The second invitation paper was on "Educational Activities of the Rubber Groups" by Harry L. Fisher of the University of Southern California and director of the TLARGI Rubber Technology Foundation. Unfortunately, Dr. Fisher was unable to attend the meeting due to illness, and a synopsis of his paper was read by Mr. Ball.

The Fisher paper pointed out that eight of the 14 local rubber groups had made some definite move in the way of educational activities. Akron has established four annual scholarships at the University of Akron. Detroit is finishing its sixth semester of two courses each semester at Wayne University. Rhode Island has sponsored a course in rubber compounding at the University of Rhode Island for the past five years. Boston has organized and is sponsoring a course in basic rubber technology at Northeastern University. Philadelphia has established a two-credit course at the graduate level at Villanova University. Connecticut is planning a program similar to Philadelphia. Chicago has had an extensive educational program for several years.

By far, the most extensive educational activity is being carried out by the Los Angeles Rubber Group. This group sponsors four separate courses. The first course is entitled Basic Rubber Technology and is given by a member of the Group. This group meets in a room supplied by the University of Southern California. The cost is $30 per person per semester and is a non-credit course. The number of students is from 30 to 45 each semester. Lecturers from industry are supplied and three evenings are in the Rubber Laboratories.

The other three courses are also provided at the University under a professor of Chemical Engineering in Rubber Technology whose salary is paid partly by the University and partly by the Group. Rubber Technology II is a senior course given two hours each Wednesday evening. Rubber Technology III is under the same professor and given three hours every Thursday evening. This is a graduate course and for graduate credit. The remaining course is entitled Rubber Technology Laboratory which is given every Monday evening under the direction of the professor and an instructor from industry. It is a two-credit course. Each credit costs the student $20 in these three courses.

The Laboratory course is one full year but each semester can be taken separately. The two laboratories contain over $65,000 worth of apparatus, practically all of which is new. The Group has over 665 members and has obtained contributions of over $90,000 from the rubber manufacturing companies in the area. Practically all the members of these courses are from industry. The attendance has varied from 4 to 23 per semester. The professor also has two graduate students working for a master's degree, one on a possible new synthetic rubber, and the other on the mechanism of vulcanization with tetramethylthiuram disulfide.

Other pertinent data contained in the

paper included the following: The New York Rubber Group has sent out a questionnaire to obtain information from its members with regard to the sponsorship of an educational course; Detroit is attempting to start a laboratory course on rubber technology; Boston is considering more advanced courses and stimulation of original papers from its membership; Philadelphia secured an enrollment of 169 for its first sponsored semester and was obliged to turn away 20 students.

Luncheon and Banquet

As usual, activities at the meeting got under way with a meeting of the 25-Year Club, the Detroit luncheon being under the chairmanship of Ed Kvet, Sr. (Baldwin Rubber). Approximately 175 were in attendance. The crowd joined the chairman in singing "Happy Birthday" to George Allison (Goodrich), who was celebrating his 65th birthday. The usual token was awarded to the oldest member in point of service present, the award being made by C. R. Haynes (National Polychemicals). The recipient was R. R. Olin (Olin Laboratories), who started in the rubber field in 1907.

Several new members were introduced during the luncheon-meeting, including E. V. Osberg, Roy Vance and John Walsh. A moment of silence was observed for five members of the club who had passed away since the last meeting. These were: H. E. Simmons, Gladding Price, R. D. Abbott, Floyd Myers, and George Loomis. The next meeting of the club will be held during the Philadelphia meeting of the Division next November, with Arthur Nellen (Lee Tire) acting as chairman.

The divisional banquet was held in the ballroom of the Sheraton-Cadillac on Thursday evening, May 5, with Chairman Ball presiding. After a good dinner, Mr. Ball called attention to the fact that this was the seventh meeting the Division has held in Detroit, and that the 1932 meeting attracted an attendance of only 135 as compared with the more than one thousand registered for the current sessions. Approximately 620 attended the banquet this year.

The chairman also stated that the Division of Rubber Chemistry was now the third largest division of the American Chemical Society, behind both the Division of Organic Chemistry and the Division of Petroleum Chemistry, on the basis of regular members only. The importance of the rubber industry to the automotive field was marked by the fact that the average car now contains some 500 rubber parts, weighing about 100 pounds, and costing approximately $60.00, exclusive of tires. Instead of introducing each individual at the head table, Mr. Ball let each one introduce his neighbor in TV panel style. This was a new, light touch.

The entertainment portion of the banquet was started with the introduction of "Mr. Hendrick Van Hoey, Director of the West European Association of Rubber Processors." It developed that "Van Hoey" had just arrived in the United States from Russia and he launched an immediate attack on the "capitalistic system," pointing out the numerous "advantages" of the Russian system. His talk was interspersed with direct references to the rubber industry and to several rubber technologists present at the banquet. "Mr. Van Hoey" was actually E. M. Sharp of the Dow Chemical Co., an amateur entertainer. A number of variety acts rounded out the entertainment feature.

Local Arrangements Committee

Although most local committees do a good job at divisional meetings, the Local Arrangements Committee for the Detroit meeting did an exceptionally outstanding job. Other than the usual difficulty with the hotel with regard to room reservations, everything went off smoothly. Full credit for this performance is due to J. T. O'Reilly (Ford Motor), chairman of the Detroit Rubber & Plastics Group, who was chairman of the Local Arrangements Committee, and who was ably assisted by W. J. Simpson Chrysler) as assistant chairman. Chairmen of the various committees included the following:

Banquet, W. A. Wiard (Dow Corning); *Finance,* H. W. Hoerauf (U. S. Rubber); *Program,* E. W. Tillitson (Wayne University); *Publicity,* W. F. Bauer (Brown Rubber; *Housing,* J. B. Craft (General Tire); *Plant Trips,* G. P. Hollingsworth (Minnesota Mining); *Registration,* E. J. Kvet, Jr. (Baldwin Rubber); *Ladies' Entertainment,* W. F. R. Briscoe (U. S. Rubber); *25-Year Club,* E. J. Kvet, Sr. (Baldwin Rubber). G. M. Wolf (General Tire) was the advisor on local arrangements.

"Pig" Radiation Source

Radiation sources of a type to be used for the first time outside government atomic laboratories will shortly be installed at the Research Center of the B. F. Goodrich Co., Brecksville, Ohio. The device, known as a "pig", will be housed in one of the main buildings of the Research Center. Weighing five tons and shielded with ten inches of lead, the "pig" was constructed by the National Lead Co. It will be loaded with flat slabs of cobalt-60 in Brookhaven National Laboratory and then trucked to Brecksville. When installed, the "pig" will make possible the extension of radiation studies started at Brecksville several years ago by Goodrich scientists. Company officials point out that investigations employing nuclear radiation have already opened new fields in the continuing search for improved rubber and plastics.

Industrial Adding New Unit

Industrial Rubber Goods Co., St. Joseph, Mich., has started construction of a new plant in St. Joseph Township. The new unit will relieve congestion at the main plant in St. Joseph. Victor Palenske, president, stated that the new building will be the first phase of what will eventually become a large plant.

SPI TO EXPLORE FEASIBILITY OF VINYL END-PRODUCT STANDARD

Exploration and evaluation of ways to develop end-product minimum standards for finished products made of vinyl film will be the objective of a new end-product standards committee functioning under the direction of The Vinyl Standards Educational Committee of the Society of The Plastics Industry, Inc., in conjunction with the over-all vinyl film industry program to promulgate compliance with the Vinyl Film Standard of Quality, U. S. Department of Commerce, Commercial Standard, 192-53. The Committee will consist of representatives of leading retailers, fabricators and processors. For ease of operation there will be special committees for each classification of end use.

In making the announcement, an industry spokesman pointed out that one of the major reasons for taking this step at this time was in response to overwhelming demand for it by retailers, retail chains, variety chains, mail order organizations and buying offices, as well as leading producers and processors of resin and vinyl film. "Countless of these organizations give their whole-hearted active support and endorsement to the program on general purpose vinyl film standard C. S. 192-53," stated the spokesman. "At the same time they have repeatedly urged that the next step to be taken should be to establish an end-product standard committee to study the possibility of developing specifications and recommendations for fabricating end-products."

Supplementary Yardstick

He went on to say that just as the Standard of Quality, C. S. 192-53 was a yardstick for consumers, retailers and fabricators to use when buying vinyl film, so an end-product standard could serve as a supplementary yardstick. "We hope to explore and evaluate the possibility of such standards in the following major categories: Rainwear, closet accessories, shower curtains, curtains and draperies, inflatables and nursery items," the industry spokesman declared.

"We feel strongly," he went on to say, "that it is our responsibility to look into this matter thoroughly from every conceivable angle in the interests of the ultimate consumer and in the interests of our rapidly growing industry."

The decision of the vinyl film processors of SPI to carry out this project was made after much preliminary research and analysis as well as a pilot study. "We already know," said the spokesman, "that there are many things to be considered. We want to start this exploration now in order to resolve any other questions which may come up. In this way we hope that this activity will serve to define and clarify the matter for all of us."

A moving rubber sidewalk carries 1200-pound paper rolls from the paper mill to an adjoining bag plant at the St. Regis Paper Co., Pensacola, Fla. The belt was manufactured by the Goodrich Industrial Products Division.

FTC REPORT ON TIRE SALES HEARD BY HOUSE SUBCOMMITTEE

In recent hearings before a House Small Business Subcommittee, headed by Representative James Roosevelt (Dem., Calif.), Federal Trade Commission attorney Edward Sheehy reported that a single oil company had received "almost $5,000,000" from two major rubber companies in an eighteen month period in return for its dealers handling certain lines of tires, batteries and accessories. Mr. Sheehy reported the arrangement without revealing the names of the companies involved.

Mr. Sheehy stated that the case was uncovered in FTC field investigations of "alleged coercive and discriminatory practices on the part of oil companies and rubber companies in distribution of tires, batteries and accessories through retail gasoline stations." The $5,000,000 were paid as "overriding commissions," he testified, on more than $56,000,000 in TBA sales by the oil company's dealers in the eighteen month period.

"As justification for the payment of overriding commissions," Mr. Sheehy said, "the investigated oil and tire companies stated that the oil companies are legitimate sales agents of the tire companies and perform selling and promotion services."

However, Mr. Sheehy said that some operators of leased filling stations stated they handled certain lines of TBA products exclusively, under threat of losing their leases. Others reported no such threats, he said.

Selected Items Checked

Checking selected items, the FTC probe found batteries, brake linings, auto heaters, jacks, mufflers, tail pipes among the items which tire companies are said to have bought from manufacturers at lower prices than other purchasers. In some cases, these were delivered directly to the oil firms who received "a commission or override of from 5 to 10% (on sales) depending upon the product and upon customer classification," the FTC attorney declared.

Mr. Sheehy told the subcommittee that his report will go before the full Federal Trade Commission in about "six months." The FTC presumably will then decide whether tire-oil company tie-ups are proper and legal.

In other testimony before the subcommittee, George J. Burger, vice-president of the National Federation of Independent Business, listed "distributor relationships" he said exist between major tire and major oil companies. He said these relationships included: "Goodrich—Texas, Gulf, Magnolia; Firestone—Union, Texas, Magnolia; Goodyear—Richfield, Shell, Gulf, Sinclair and Magnolia; U. S. Rubber—General Petroleum, American, Magnolia, Sun Oil and Socony Vacuum."

A translucent packaging film based on a new Bakelite polyethylene resin, and designed to make bags easier to open for filling, has been announced by the Bakelite Co., New York, N. Y.

SHELL CHEMICAL ANNOUNCES SYNTHETIC RUBBER STAFF APPOINTMENTS

M. Voogd

J. P. Cunningham

Shell Chemical Corp. has announced appointments on both the manufacturing and marketing sides for its newly-acquired synthetic rubber facilities in southwestern Los Angeles, Calif. M. Voogd, manager of the butadiene plant at Torrance, built and operated by Shell Chemical during and after World War II, has been named manager of the combined butadiene-styrene-copolymer facilities purchased from the government. G. S. Williamson, formerly superintendent at the butadiene plant, has been named superintendent of all the plants. The company also announced that a new branch of the Marketing Department to handle the sale of synthetic rubber has been established. J. P. Cunningham, previously manager of the Product Development Department in New York, has been named manager of the newly-created Synthetic Rubber Sales Division with headquarters in Los Angeles. J. E. Toevs, lately district chemical sales manager in Los Angeles, has been named sales manager for the new division.

The following additional manufacturing appointments were made: E. S. Martin, formerly senior technologist in the head office, as assistant superintendent; D. A. Limerick, formerly manager of the Operations Department at the butadiene plant, as assistant superintendent; J. Levada, chief engineer of the butadiene plant, as chief engineer; M. L. Sagenkahn, formerly chief technologist at Martinez, Calif., as chief technologist; A. H. Anderegg, formerly assistant chief chemist at Houston, Texas, as chief chemist; and W. C. Bevil, treasury manager at Houston, as treasury manager.

Other appointments on the sales side were: F. W. Hannsgen, formerly district manager at Newark, N. J., as manager of sales development; H. E. Sparks, formerly associated with the Distribution Department at the New York office, as manager of distribution operations; D. E. Fuller, formerly chief accountant of the Ammonia Division at San Francisco, as treasury manager; and R. D. Sullivan, formerly associated with the Shell Development Co., as manager of technical service.

Monsanto Develops New Elastomer

Development of a new synthetic elastomer, with unusual resistance to petroleum and chemical hydraulic fluids which impair presently available elastomers, has been announced by the Organic Chemicals Division of the Monsanto Chemical Co., St. Louis, Mo. Principle use for the new material, which the company has trademarked "Vyram," is expected to be in the field of hydraulic packings. An acrylate-type elastomer, the new product can be fabricated easily into standard packings and gaskets using conventional rubber processing equipment. Company officials stated that although the material has certain deficiencies, notably indicated stiffening at extremes of temperatures, it has performed well in limited simulated field condition tests with industrial and government cooperators. In addition to its unique ability to withstand the swelling action of a wide range of fluids, Vyram has been shown to be unusually resistant to ozone. The new material, which can be handled in standard rubber mills and other fabricating equipment, is supplied in the form of black crumbs as a masterbatch of the following composition: Polymer, 100 parts; "Dixie 5" carbon back, 30 parts; "Cab-O-sil" silica, 10 parts, and oleic acid, 1 part. The company states that because of the complete chemical saturation of the new material, conventional sulfur-accelerator cures are of little value, and a new curing system has been developed with lead oxide as the primary curing agent and magnesium oxide to eliminate porosity.

Goodyear's Aviation Products Division has designed a platen gasket for use in aircraft fuel systems that is said to be especially effective where gasket problems exist with hydrocarbon fuels.

DEVELOPMENTS IN TC RUBBER OUTLINED BY RGA COMMITTEE

The Commercial Research Committee of the Rubber Growers' Association, London, England, has, in past months, endeavored to ascertain the demand for technically classified rubber by manufacturers. To this end, inquiries were addressed by RGA to the Rubber Manufacturers Association, Inc., the Rubber Trade Association of New York and to British rubber manufacturers, through the Rubber Trade Association of London. As a result of its inquiries, the Commercial Research Committee is of the opinion:

(1) There is a steady, growing demand for technically classified rubber, especially from small consumers in Europe for the medium classification—yellow circle rubber, and estate producers should be encouraged to make this type. There is also a small spasmodic demand for blue circle rubber from manufacturers in the United States.

(2) The demand is generally from smaller manufacturers, and in most cases from smaller countries in Europe.

(3) So long as this limited demand exceeds the supply of technically classified rubber, producers of technically classified rubber may get a small premium, and will at least be able to sell their produce more readily.

(4) It is just as important to be sure that the technically classified rubber is easily available for those consumers who are interested as it is to produce technically classified rubber, and the gradually increasing demand could best be met by producers showing willingness to sell for shipment and to consign their technically classified rubber for sale on the Singapore market.

(5) In view of the impracticality of classifying the lower grades which cannot in any case be blended any more easily than is now done by the large manufacturers, the endeavor to classify smallholders' rubber should not be proceeded with.

Atlas Premium Safety Tire

A premium safety tire using a new tread material is about to be introduced by Standard Oil Co. (Indiana) through the Midwest. Dwight F. Benton, sales vice-president of Standard, said the new tubeless Atlas premium tire is made with an incredible tough tread material called "Viprene," the first synthetic rubber developed by private industry since the war. "Viprene makes possible a tire of only normal tread depth but with 50% greater mileage than tires with normal tread depths now in use," Mr. Benton asserted. "This gives cooler running temperatures with maximum resistance to tread separation." He said the tire's cord, using a second new synthetic, "Plycron," perfects the bond between the tread and carcass and cuts down internal friction heat. Mr. Benton said the tires, guaranteed for two years, are being stocked on a limited basis by most Standard Oil dealers and will probably cost about twice the price of an ordinary tire.

Chemical Progress Week

During 1954 America's dynamic chemical industry completed over $1,000,000,000 in new plants and facilities. Another $1,500,000,000 will be completed within the next two and one half years. These new facilities mean more jobs, more tax returns for local and federal governments and more new or improved products for the consuming public. The expenditure on construction itself bolsters our economy in payments for construction, wages and materials. In 1952 the President's Materials Policy Commission predicted that the chemical industry would quadruple its 1950 productive capacity by 1975. The intervening years have helped to substantiate that prediction. The week May 16-21 is "Chemical Progress Week", a time in which the chemical industry reminds the American people of the role it plays in their daily life and the contribution it makes to the economy as a whole.

Injury Reporting Systems

The Bureau of Labor Standards of the U. S. Department of Labor, Washington 25, D. C., has just released four publications in a series designed to improve injury reporting systems throughout the country, and to provide fullest use of the data compiled. The series was prepared by authorities in the field of injury statistics and have been made available at the request of the Committee on Accident Records, Analysis and Use of the President's Conference on Occupational Safety. Subject titles of the first four in the series are: (1) Accident Cause and Cause Coding; (2) Estimating Costs of Industrial Accidents; (3) Investigation of Accidents for Cause and Remedy, and (4) Work Injury Rates. Copies may be secured from the Bureau of Labor Standards.

French Silicone Production

Societe Rhone-Poulenc has started commercial production of a complete line of silicones in its recently-completed plant at St. Fons, near Lyon, France. The $3,000,000 plant, built on a 10-acre site, has the most up-to-date facilities for research and production on a large scale. Societe Rhone-Poulenc was the first company in France and possibly in Western Europe to undertake production of silicones, to meet the growing European demand. It initiated research on silicones in 1942 and was successful in continuing development work on a secretive basis during the German occupation. Following years of pilot plant production, construction of the new plant, known as "Les Carriers", was started last summer.

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FORT WAYNE ELECTS OFFICERS; HOLDS SYMPOSIUM ON CURING

The Spring Meeting of the Fort Wayne Rubber and Plastics Group held on April 14 at the Hotel Van Orman in Fort Wayne, Ind., attracted approximately 180 members and guests. The meeting featured an election of officers for the 1955 season of the group and a panel discussion on "Fast Curing Techniques." The newly-elected officers are:

Chairman, Jack L. Carlson (Paranite Wire and Cable); *Vice-Chairman,* M. J. O'Connor (O'Conner & Co.); *Secretary-Treasurer,* John Dixon (Anaconda Wire & Cable). The newly-elected officers will assume their posts on June 10, after the summer outing of the group. The following members were elected to the board of directors: Harold Anderson (General Tire), Don Sprott (Auburn Rubber), Reed Williams (Dryden Rubber), M. Jones (Marbon), Gerald Gonyer (Farrel-Birmingham), and Tom Pollard (Monsanto).

Panel members for the symposium on "Fast Curing Techniques" included Edward Wray (Belden Mfg.), who spoke on "Manufacture of Wire by the Continuous Vulcanization Process"; Hugh Bethell (R. T. Vanderbilt), who spoke on "Acceleration for Fast Cures," and John M. Bierer (Boston Woven Hose), who spoke on "The Rotocure Process." A complete report on the technical portion of the meeting will appear in a future issue of RUBBER AGE.

To Receive Safety Award

According to a recent announcement by the National Safety Council, the U. S. Rubber Co., New York, N. Y., has been given the Award of Honor for the record of safety it established in 36 domestic plants during 1954. To win the award, a company must show outstanding improvement compared with its average safety record for the preceding three years, and the three-year safety record of the industrial group to which it belongs. Only 25 companies in all of industry have been singled out for the award this year. It is the second time it has been won by U. S. Rubber. During 1954, the company had 2.5 lost-time accidents for every million man hours worked. For the preceding three-year period, the company averaged 3.7 accidents for each million man hours, and the entire rubber industry averaged 5.5 lost-time accidents for the same period.

Elections at Better Monkey Grip

L. M. Everett has been named chairman of the board of the Better Monkey Grip Co. and the Monkey Grip Tread Rubber Co., both of Dallas, Texas. His son, T. H. Everett, has assumed the presidency of both companies, succeeding his father. Jack R. Everett has been re-elected vice-president, and Luke M. Everett has been re-elected vice-president and treasurer. The new president will continue to manage sales for the company as he did in his former position as vice-president.

ONTARIO ELECTS OFFICERS; HEARS SERVAIS ON SILICONE

The April 12th meeting of the Ontario Rubber Section of the Chemical Institute of Canada, held at the Pickfair Restaurant in Toronto, featured an election of officers for the new season and an address by P. C. Servais, of the Dow Corning Corp., Midland, Mich. Mr. Servais spoke on "Preparation, Properties and Uses of Silicone Rubber." In addition, a film entitled "What is a Silicone?" was shown. The following members were elected to office at the meeting:

Chairman, W. H. Bechtel (Kaufman Rubber); *Vice-Chairman,* G. Grushcow (Dayton Rubber); *Secretary,* Wray Cline (Canadian General Tower), *Treasurer,* Carl Croakman (Binney & Smith). The following members were elected to the positions noted: *Toronto Representative,* Bruce Williams (Dunlop Canada); *Hamilton Representative,* Rudy Berner (Boston Insulated Wire & Cable); *Kitchener Representative,* Russel Tartaglia (Goodrich); *Representative at Large,* Des Seymour (Polymer); *Golf Committee,* Lloyd Lomas (St. Lawrence Chemical) and Art Luscombe (Hardesty).

Silicone Rubber Advantages

In his address, Mr. Servais stated that the advantages of silicone rubber are its stability to temperatures as high as 500°F. and as low as —100°F.; its excellent behavior as an electrical insulator, and its weather and oil resistance.

Its limitations are those of physical strength, price and solvent resistance, he stated. Research and development work are being done to improve the physical strength of silicone rubber. As advances are made in polymers, fillers, additives and vulcanizing agents, rubbers of better strength are being obtained.

The polymer is generally dimethylsiloxane. It is this polymer that imparts to the silicone rubber many of its unusual properties. Replacing some of the methyl groups with phenyl groups makes silicone rubber that is flexible at temperatures as low as —150°F. Replacement of some of the methyl groups with vinyl groups introduces unsaturation to the polymer. This makes it possible to vulcanize silicone polymers with sulfur containing vulcanizing agents. Blending and covulcanizing with organic rubbers is then possible, Mr. Servais explained.

Fillers can be divided into two classes; nonreinforcing and reinforcing. The nonreinforcing types are iron, titanium, zinc and silicon oxides. Reinforcing types are the synthetic silicon dioxides. Most of the recent advances in silicone rubber compounds have been made with the use of the synthetic silicon dioxides. Additives are used to produce low compression set, heat stability, color or sponge.

Vulcanizing agents are generally the strong organic peroxides. They are activated by heat and are generally to be used with simultaneous application of pressure. Some types are available that do not require the application of pressure. It is important to avoid any organic contamination during vulcanization.

The usual organic rubber equipment is used both for compounding and fabricating. Compounding is relatively simple because of the small number of ingredients. Fabricating follows closely with that of organic rubber with the exception that after the parts have their initial vulcanization, a high temperature oven cure is necessary.

Applications are of two types; those that replace organic rubber where it is not doing a good job and new uses where organic rubbers have not been used. Applications are found in almost every industry including aircraft, automotive, electrical, appliance and food, he stated.

PROMOTION OF MAPLES AND WIEDENMANN ANNOUNCED BY FIRESTONE

J. W. Maples

H. H. Wiedenmann

Firestone Tire & Rubber Co., Akron, Ohio, has announced the promotion of James W. Maples to director of manufacturing for all Firestone rubber manufacturing plants in the United States and Canada, and the promotion of Herbert H. Wiedenmann to production manager of the company's tire plants, the position formerly held by Mr. Maples. Mr. Maples was graduated from Yale University in 1925 and joined the College Training Class of the Firestone company the same year. In 1926, he was assigned to the Jacksonville, Fla., district as a territory salesman. In 1927, he returned to Akron in the Tire Production Division. Mr. Maples became superintendent of Plant 1 in 1933. A year later, he became factory manager of the company's British plant and held that post for ten years. In 1944, he returned to the U. S. to become production manager for all the company's tire plants in this country.

Mr. Wiedenmann graduated from the University of Minnesota in 1926. He joined Firestone in 1928 as a factory employee in California at the same time taking graduate work in the University of Southern California. In 1929, he became a member of the Development Department where he remained for the next five years. During the next two years, Mr. Wiedenmann was general foreman in the California plant. In 1936, he was named manager of the Tire Building and Curing Departments and five years later was appointed production manager of the tire plant. During World War II, Mr. Wiedenmann was manager of the Fuel Cell Division. In 1945, he was named assistant factory manager of the Pacific Coast plant and five years later was named factory manager. Mr. Wiedenmann was transferred to Akron in 1952 as manager of the local Firestone tire plants.

Chemical Industries Exposition

The 25th Exposition of Chemical Industries will be held at the Commercial Museum and Convention Hall in Philadelphia, Penna., on December 5 to 9, under the management of the International Exposition Co., 480 Lexington Avenue, New York 17, N. Y. As heretofore, the exposition will cover the many aspects of chemistry and chemical engineering that are applied throughout the industrial world, including achievements accomplished since the last exposition was held two years ago.

Kel-F Plastic Dispersions

M. W. Kellogg Co., Jersey City, N. J., has announced the commercial introduction of "Kel-F Plastic Dispersions," chemically inert, high temperature-resistant materials which may be applied by spraying, dipping or spreading to a broad variety of metallic and non-metallic surfaces. Two major types of Kel-F Dispersions are available commercially: "NW-25-TR," a low-viscosity dispersion supplied at normal spray viscosity (Zahn G-1 viscosity of 32-34 seconds), and "N-2," a high viscosity dispersion for spread, flow, and dip coatings. A third type of Kel-F Dispersion available is designated as N-1. This dispersion, also consisting of 1-20 micron size particles, is supplied at 35% solids.

Keychain Rubber Packing Set

An attractive, industrial rubber sheet packing set, secured by a metal keychain for easy access to desired sample, is now available from Hamilton Rubber Manufacturing Corp., Trenton 3, N. J. The set includes popular Red and Black Sheet, Diaphragm, Cloth Inserted, All Rubber and Neoprene constructions. It is said to be ideal for gasket cutters and distributors.

D-11 RECOMMENDATIONS APPROVED BY ASTM STANDARDS COMMITTEE

In actions taken on January 10, 1955, the Administrative Committee on Standards of the American Society for Testing Materials, approved a number of recommendations from ASTM Committee D-11 on Rubber and Rubberlike Materials. These recommendations included three new tentative specifications, a recommended practice, and numerous revisions of existing standards. The new and revised tentatives, as approved by the Standards Committee, are described briefly below:

In Tentative Specifications for Polyethylene Insulated Wire and Cable (D 1351), Committee D-11 provides purchase specifications for electrical wires and cables insulated with polyethylene which has come recently into extensive use. The polyethylene used conforms to ASTM Tentative Specifications for Polyethylene Molding and Extrusion Materials (D 1248). Wire so insulated is considered suitable for continuous operation for conductor temperatures up to 75°C. with a maximum conductor size of 500,000 cir mil. The maximum voltage shall not exceed 5000 v for power application or 10,000 v for series lighting. If the insulated conductor is to be exposed to light or weather, special pigmentation of the insulation or suitable protective coverings should be used.

Tentative Specification for Ozone-Resisting Butyl Rubber Insulation for Wire and Cable (D 1352) fills another need not previously covered in ASTM specifications. This specification covers a vulcanized rubber insulating compound, the rubber hydrocarbon of which consists substantially of Butyl rubber. This type of insulation is considered suitable for continuous operation at conductor temperatures up to 80°C. and is considered suitable for all sizes and voltage classifications of single and multiple conductor power cables.

Standard Test Temperatures

Recommended Practice for Standard Test Temperatures for Rubber and Rubberlike Materials (D 1349) was prepared by the committee in order to promote standardization by the elimination of many odd temperatures in testing when trivial differences are involved. Its use should result in reduction of the number of ovens required in a laboratory and in improved operation as well as in providing a better basis for comparing results.

Committee D-11 has completed a thoroughgoing review of all of the ASTM specifications for insulated wire and cable. The reorganization of these specifications and transfer of construction details into a new, separate specification to which the individual specifications shall refer will greatly increase their utility and reduce a great deal of printing duplication. Tentative Specification for Construction of Rubber Insulated Wire and Cable (D 1350) covers constructional details, materials and voltage test requirements of rubber insulated wire and cable for the distribution of electrical energy. It does not include specific designs for special services or unusual conditions.

Along with this specification the Standards Committee also approved the requisite changes in the following standards to effect the separation of construction details into the new Specification D 1350:

Tentative Specification for Natural Rubber AO Insulation for Wire and Cable (D 27).

Tentative Specification for Natural Rubber Performance Insulation for Wire and Cable (D 353).

Tentative Specification for Natural Rubber Heat-Resisting Insulation for Wire and Cable (D 469).

Tentative Specification for Ozone-Resisting Insulation for Wire and Cable (D 574).

Tentative Specification for Heavy Duty Neoprene Sheath for Wire and Cable (D 752).

Tentative Specification for Synthetic Rubber Heat-Resisting Insulation for Wire and Cable (D 754).

Tentative Specification for Synthetic Rubber Performance Insulation for Wire and Cable (D 755).

Tentative Specification for GR-S Synthetic Rubber Sheath for Wire and Cable (D 866).

Tentative Methods of Testing Rubber and Thermoplastic Insulated Wire and Cable (D 470).

Revision and Reversion to Tentative of Standard Specification for Natural Rubber Sheath for Wire and Cable (D 532).

Revision and Reversion to Tentative of Standard Specification for Light Duty Neoprene Sheath for Wire and Cable (D 753).

Revisions of other tentative methods and specifications as approved by the Standards Committee, include the following:

Tentative Methods of Chemical Analysis of Rubber Products (D 297) are revised to include some corrections and improvement of the new methods for determining copper and manganese.

Revision of Tentative Methods of Test for Change in Properties of Elastomeric Vulcanizates Resulting from Immersion in Liquids (D 471) makes them more specific, easier to use, and more in line with present practice. Many of these changes are editorial in nature.

The standard exposure period has been changed in Tentative Method of Test for Low Temperature Brittleness (D 736) which previously specified 96 hours for natural rubber and five hours for synthetic rubber. The committee has found that for the purposes of this method five hours is adequate in both cases.

Heat Aging Revised

Revision of Tentative Method of Heat Aging of Vulcanized Natural or Synthetic Rubber by Test Tube Method (D 865) permits use of aluminum block heating instead of oil bath only. This usage, which has been finding wide acceptance, has proved to be completely satisfactory and eliminates a fire hazard.

The committee established a definite standard time in the mechanical stability test instead of the former provisional one in Tentative Specifications and Methods of Test for Concentrated, Ammonia Preserved, Creamed, and Centrifuged Natural Rubber Latex (D 1076). It is also changing the methods for copper and manganese to those proposed by Subcommittee XI on Chemical Analysis of Rubber Products.

Seven new grades of gasket material which are currently in use and for which specifications are needed are added to Tentative Specifications for Nonmetallic Gasket Materials for General Automotive and Aeronautical Purposes (D 1170). In the natural rubber and synthetic rubber groups the added materials are G 1422-1, G 1422-2, G 1423-2 and G 1422-3. Materials added in the treated and untreated paper classification are G 3243-3, G 3242-2, G 3242-3.

Harshaw Acquires Zinsser

Harshaw Chemical Co., Cleveland, Ohio, which earlier this year indicated it intended to acquire all the outstanding stock of Zinsser & Co., Hastings-on-Hudson, N. Y., has revealed that the acquisition transaction has been completed. Zinsser operations will continue under present policies and management as a wholly-owned subsidiary of Harshaw. Initial emphasis will be on new products, development and integration of research by the two companies. Zinsser's new directors are J. L. Berston, H. W. Dingee, R. H. Giebel, W. J. Harshaw, W. C. Hovey, C. S. Parke and A. D. Perry. Dr. A. Burger is continuing as research director and Dr. F. G. Zinsser, who founded the company in 1897, continues his association with the business as chairman of the advisory committee.

Appointed Factory Manager

Robert T. Croysdale has been appointed factory manager of the Fremont, Ohio, plant of Hewitt-Robins Inc., it was announced recently by Robert A. Nilsen, vice-president and general manager of the company's Restfoam Division. Mr. Croysdale was formerly general foreman in the Molded Goods Division of the B. F. Goodrich Co., Akron, Ohio. He is a graduate of Miami University, Oxford, Ohio, class of 1941, and he served three years in the U. S. Navy during World War II. He also attended the U. S. Naval Academy and Akron Law School. Products manufactured at the Fremont plant include foam rubber and flooring items such as rubber and vinyl tile, sponge rubber carpet underlay, foam backed rugs and stair treads.

Chemical Products Expanding

Chemical Products Corp. has announced plans for the construction of a 37,500 square foot addition to its plant in East Providence, R. I. The third addition to the company's plant since 1951, the new facilities will permit an increase in the research and development laboratory and provide needed warehouse space. The new building will be 250 feet long and 125 wide and will be of concrete and reinforced steel construction with insulated metal siding. It is scheduled for completion in the early fall. Chemical Products produces a line of vinyl plastisols and engages in research activities. It also manufactures coatings and lacquers.

COLUMBIAN CARBON TERMINATING SALES TIE WITH BINNEY & SMITH

Additional facts relative to the pending dissolution of sales arrangements between the Columbian Carbon Co., Inc., and Binney & Smith, Inc., both of New York, N. Y., were brought to light in the recently issued Columbian Carbon annual statement.

It was pointed out that the present Columbian Carbon Co. was organized in 1921. Even prior to that date, and continuing through to the present time, a separate corporate entity, Binney & Smith, Inc., has been the exclusive selling agent of the principal pigments produced by Columbian Carbon, namely carbon blacks and iron oxides. At no time has Columbian Carbon had any ownership interest in Binney & Smith.

The report states that notwithstanding the excellent service rendered Columbian Carbon by Binney & Smith, the complete responsibility for satisfying market and customer demands has long made it appear inevitable to the Columbian Carbon management that sales of the company's products be integrated into its new operations.

Early in 1953, the Columbian Carbon management resolved to bring such integration about. Consequently, efforts to find a feasible program for the merger of Binney & Smith into Columbian Carbon were intensified. They were finally frustrated "by the inability of Binney & Smith, Inc., to obtain the stockholder consent necessary to include the considerable operations it conducts outside its selling agency activities for Columbian."

Unwilling to delay the complete integration of its business any longer, Columbian Carbon's board of directors instructed the management on December 14, 1954, to give due notice of termination of all agreements under which Binney & Smith sells Columbian products.

Organizing Sales Department

During the interim since the last-mentioned date, the Columbian Carbon management has been taking proper measures for the organization of its own sales department. The company has also been evaluating the facilities and property employed by Binney & Smith in Columbian service with the purpose of determining a reasonable basis, and one equitable to both parties, for taking over such facilities and property. Completion of such a program will "effect a smooth transition of sales of company products into its own operations upon the termination of the present exclusive sales arrangements on June 30, 1955."

At a stockholders' meeting on April 26, Carl Kayser, president of Columbian Carbon, amplified the statement which appeared in the company's annual report and stated:

"At this date the two companies, Columbian Carbon and Binney & Smith Inc., are in agreement in principle as to the facilities and property employed by Binney & Smith Inc. in Columbian service and have agreed, furthermore, on the main terms and conditions under which such facilities and properties shall pass into Columbian possession. Counsel for both sides are presently engaged in reducing these agreements to an acceptable contract form, which shall also suggest the coverage of lesser particulars of detail not yet dealt with.

"I think it safe to say that the final program alluded to in our 1954 Annual Report is on the way to satisfactory completion by this coming June 30th. In any event, Columbian is fully prepared to carry on its own sales at any time from now on of all pigments produced by it, without slackening or interruption of service to the domestic and foreign markets for its goods."

McCOLLUM and McCURDY NAMED DUPONT TECHNICAL SALES REPRESENTATIVES

O. H. McCollum

J. M. McCurdy

E. I. du Pont de Nemours & Co., Inc., has announced that growing demand for its products, especially such new lines as "Hypalon" chemical rubber and "Hylene" organic isocyanates, has necessitated further expansion of its Elastomers Division. O. H. McCollum, formerly a compounder at the division's rubber laboratory in Deepwater Point, N. J., has been named technical sales representative and assigned to the Chicago district office. James M. McCurdy, a chemist at Deepwater Point, has joined the Detroit sub-office of the Akron district, also as technical sales representative. Mr. McCollum received a degree in chemistry from Cornell University in 1939. Following graduation, he became a chemist for the Firestone Tire & Rubber Co. in Akron, and later, chief chemist of Firestone's plant in Bombay, India. He jointed DuPont in 1947 as a compounder at Deepwater Point, and from 1950 to 1953 was attached to the division's rubber laboratory in Akron. Mr. McCurdy was graduated from Carnegie Institute of Technology in 1947 with a degree in chemical engineering. For two years he was with Goodyear's Process Development Division in Akron, and later became assistant to the chief chemist of Ball Brothers Co., Muncie, Ind. He joined DuPont in 1952 as a compounder at the rubber laboratory, and from 1953 until early this year was sales correspondent and administrative assistant in the division's Boston office.

Dayton Registers Debentures

Dayton Rubber Co., Dayton, Ohio, has registered $3,000,000 of its 15-year convertible subordinate debentures with the Securities and Exchange Commission. Lehman Brothers will manage the underwriters on these securities and is also arranging placement of a $2,000,000 4% Dayton Rubber note, due December 1, 1970, with the Equitable Life Assurance Society of the United States. Proceeds will finance expansion of inventories to take care of increased sales.

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Low Temperature Plasticizer

Argus Chemical Corp., Brooklyn, N. Y., has announced the development of a new low temperature plasticizer for use in neoprene. Recently concluded tests indicated that "Drapex 3.2," as the new plasticizer is called, adds many valuable properties to neoprene at a lower cost than most presently used low temperature plasticizers, the company states. The low temperature impact resistance of neoprene stocks with Drapex 3.2 is equivalent to that obtained with dioctyl sebacate. It adds superior resistance to extraction or swelling by oil, and has a very low volatility. Its low specific gravity is also said to reduce volume costs.

Aluminum-Sheathed Cable Extruder

General Cable Corp., New York, N. Y., has announced that a new press for the production of direct-extruded aluminum-sheathed cables has been completed by Schloemann of Dusseldorf, West Germany, and will be installed in the company's plant in Perth Amboy, N. J., in mid-1955. The press is said to be the first which will be used in the United States for the production of direct-extruded aluminum-sheathed cables. Representatives of Schloemann will supervise installation of the new press and the start of its operation.

SWEDISH RUBBER TECHNOLOGY INSTITUTE HOLDS CARBON BLACK SYMPOSIUM

The Fall Meeting of the Swedish Institute of Rubber Technology, held on November 26 in Stockholm, Sweden, featured a "Symposium on Carbon Blacks." The Institute has now made available a book covering all the papers presented at the symposium. Copies of the book may be obtained from Sveriges Gummitekniska Forening, Stockholm 7, Sweden, at $6.15, postage free. There follows herewith a report on the papers presented at the symposium.

"Types of Carbon Blacks Manufactured: Processes and General Properties," was the title of the paper presented at the symposium by Jan Willums (Phillips Chemical). Mr. Willums stated that it is believed that the present trend toward the use of the higher reinforcing oil furnace blacks is firmly established. There is a growing interest in these finer particle size blacks, and their advantages and the physical properties which can be obtained in various polymers are being intensively studied. These higher reinforcing blacks, stated the author, are valuable in both synthetic and natural rubber compounds.

C. W. Sweitzer (Columbian Carbon) also presented a paper at the symposium, this one entitled "The Role of Carbon Structure in the Reinforcement of Rubber." Carbon structure was shown to be present in all carbon blacks, in varying degrees, the persistence of this structure determining its ultimate role in rubber. The fragile type of structure inherent at the time of manufacture is largely lost in the processing of the dry black, while the more permanent structure largely persists during processing in rubber. This distinction is more one of degree than of kind, the speaker said.

Presence of Carbon Structure

The presence of carbon structure in rubber compounds has been shown to have a significant effect in stiffening rubber. Associated beneficial effects include improved extrusion, abrasion, and in the case of tread carbons, greater road wear also. The penalties incurred in obtaining viscosity effects in rubber through carbon structure are mild compared to those encountered when alternative methods are used. Carbon structure, said the author, is the most effective and economical means for securing viscosity and extrusion benefits in rubber with the minimum penalty of hysteresis.

"The Influence of Pelletizing and Packaging on the Dispersibility of Carbon Blacks" by L. D. Carver (Witco) and R. A. Reinke (Witco-Continental) was another of the papers presented at the symposium. This paper was read by J. A. White of Witco's London office. In this paper, the authors described the preparation of wet and dry pelletized blacks. The uniformity of the black produced by pelletization assures good dispersion in the Banbury.

It was stated that by compressing pelletized black a reduction of 20% in volume may be obtained. This new method of packaging for export results in savings in ocean freight costs and also provides for easier handling.

In his paper on "Non-Staining Carbon Blacks," Harry J. Collyer (Godfrey L. Cabot) presented information to show that staining is of two major types: "contact stain" and "migration stain." Mr. Collyer observed that where suppression of stain is important, all of the ingredients of the compound require careful consideration; non-staining carbon blacks of a wide range of processing and reinforcing characteristics are fortunately available.

The author then presented methods for assessing the staining tendencies of carbon black. These include gravimetric and colorimetric estimations of the extractable matter present on the black and various tests on the compounded rubber stock. Reference was made to the applications of non-staining carbon blacks and some of the factors important to the manufacturing operation were discussed.

Blends of Carbon Blacks

"Blends of Carbon Blacks: Technical and Economic Aspects" was the title of the paper presented at the symposium by N. C. H. Humphreys (R. W. Greef). It was stated that rubber manufacturers have at their disposal a range of rubber grade blacks comprising many categories and about 150 trade brands. With so large a number from which to choose it is clear that the vast majority of black vulcanized rubber products can be made successfully without resorting to blends of carbon black.

The speaker noted that two factors must be considered other than the satisfactory technical properties of the vulcanizates. These are: (1) Material costs, and (2) Matters appertaining to processing and production. The speaker discussed both of these factors in his paper.

G. J. van Amerongen (Rubber-Stichting), for his part in the symposium, presented a paper on "The Influence of Carbon Black on Oxidation, Hysteresis and Wear of Rubber." The speaker stated that three properties, oxidizability, hysteresis losses and tread wear of rubber compounds with various blacks have been studied with the ultimate aim of a better understanding of tire behavior.

It was shown that the rate of oxidation of various rubber-black compounds increases with the surface area of the black used. Similarly, the solubility of oxygen in the rubber compounds increases with the surface area of the black. These results suggest a direct correlation between rate of oxidation and oxygen solubility.

The measurement of the dynamic-mechanical properties and hysteresis in particular, show that addition of black to rubber leads to higher energy losses on repeated deformations. However, a direct correlation can be shown to exist between surface area of the black and energy losses on deformation. The heat build-up as measured with the Goodrich Flexometer is in agreement with the results of these measurements, the speaker noted.

Data for treadwear, as measured in special standardized road tests confirm the high wear resistance of ISAF and SAF black compounds. The speaker discussed the point that a low oxidizability and high heat resistance of the rubber compound may be favorable for a high wear resistance. On the other hand, black compounds with higher hysteresis losses on repeated deformation usually show a higher wear resistance. Apparently, the use of blacks of smaller particle size leads primarily to an improvement of those mechanical properties which are relevant to wear resistance. This improvement, the author said, overcompensates the weakening effect of higher temperatures resulting from higher hysteresis losses.

In his paper on "Future Trends in Carbon Blacks," Dr. I. Drogin (United Carbon) noted that the trend in the carbon black industry is to reduce the number of rubber-grade blacks from the sixteen existing types to three general types. The three functional types, he said, will be a carbon black for tire treads, a general purpose carbon black for tire carcasses and sidewalls and for higher quality mechanical goods, and a low-cost black primarily for mechanical goods.

The carbon black for tire treads will necessarily be a fine particle size black and will be produced from the most economical hydrocarbons that will give a carbon black of the desired qualities. The general purpose carbon black for tire carcasses will be less reinforcing than the tire tread black, and therefore more economical. The low cost black primarily for mechanical goods, will be produced by a process that will insure high yields and will permit greater loadings of black in compounds without greatly increasing hardness or cost.

Carbon Blacks of Future

Dr. Drogin stated that the carbon blacks of the future will be expected to contribute higher abrasion resistance, more separation resistance, greater tear resistance, cooler running, less cracking, greater fatigue resistance, greater impact resistance and better retention of properties at the temperatures developed at high speeds.

In addition to the paper, reported on above, Dr. H. Westlinning (Degussa) also spoke at the symposium.

Appointed Works Manager

The appointment of Julius C. Hydrick as works manager of the Quaker Rubber Corp., a division of the H. K. Porter Co., Inc., Philadelphia, Penna., was recently announced. Mr. Hydrick was formerly works manager at Quaker from June, 1950, until November, 1951, when he was transferred to another Porter Division, the Delta-Star Electric Co. in Chicago, Ill., as works manager. Mr. Hydrick is a graduate of Louisiana State University with a bachelor of science degree in electrical engineering. His duties at Quaker will include the supervision of all factory personnel and plant operations.

Phillips Chemical Appointments

A number of management promotions in the Phillips Chemical Co., wholly-owned subsidiary of the Phillips Petroleum Co., became effective April 1, according to K. S. Adams, chairman, and Paul Endacott, president of both companies. Most of the advancements arose in connection with Phillips' acquisition of the Plains butadiene and copolymer plants near Borger, Texas, which have been operated by the company for the government. The changes are headed by the promotion of W. C. Hewitt from general operating superintendent to assistant general manager of the chemical company under T. L. Cubbage, vice-president and general manager. Mr. Hewitt advanced through various position in Phillips operations to Plains plant superintendent prior to transfer to the Bartlesville, Okla., headquarters in 1951.

Two of the other promotions moved Borger employees to Bartlesville. A. J. Head, Philblack plant superintendent, became director of the Manufacturing Division, in charge of all the chemical subsidiary's plant operations. A. B. Leonard, Plains plant superintendent, was assigned the new position of director of the Rubber Chemicals Division, responsible for butadiene, rubber and carbon black sales.

G. H. Short, Borger, was advanced from assistant plant superintendent to replace Mr. Leonard as Plains plant superintendent. H. E. Haltom, who has been superintendent of terminaling operations at Phillips Chemical's Adams Terminal on the Houston Ship Channel, Pasadena, Texas, returned to Borger as Philblack plant superintendent, replacing Mr. Head.

H. D. Trotter, formerly mechanical superintendent at the parent company's Kansas City refinery, transferred to the Plains plant as assistant plant superintendent. In other changes at Plains plant, C. M. Tucker was moved up to manufacturing superintendent; he was succeeded as process superintendent by L. J. Ronayne, who returned to the plant from the position of employee relations assistant in the Bartlesville office of Phillips Chemical.

At the Adams Terminal site, Pasadena, Texas, where the company operates ammonia, ammonium sulfate, triple superphosphate and pyridine plants and a deep water terminal, several promotions followed H. E. Haltom's advancement to Philblack plant superintendent at Borger. W. R. Pittman replaced Mr. Haltom as superintendent of terminaling operations. He was succeeded as mechanical and maintenance superintendent for all facilities at the site by G. K. Young. Earl Geoffrey, formerly technical assistant to Mr. Young, replaced him as maintenance supervisor, the company stated.

New Rubber Map Available

Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn., has announced the availability of a revised edition of its "Rubber Map of the World." The map shows the principal rubber producing areas of the world together with pertinent statistical information as to production and consumption.

MacConnell Joins "Rubber Age"

T. T. MacConnell

T. T. "Mac" MacConnell, who was associated with the U. S. Rubber Reclaiming Co., both in New York City and Buffalo, N. Y., from 1941 through 1952, as assistant secretary and sales representative, has joined the staff of RUBBER AGE in an accounting capacity. He will also function as office manager, and will serve with other departments where his knowledge of the rubber industry can best be put to use in the interests of this journal and its subscribers. Prior to entering the rubber field, Mac spent several years as a public accountant.

Mr. MacConnell was born in Brooklyn, N. Y., on September 22, 1904. After receiving his primary education in the New York City school system, he attended prep school at Urbana, Ohio. His first job was in the Wall Street district, where he served both as a runner and later as a cashier. He subsequently worked in the statistical department of the Texas Co. and then for a three-year period worked as a public accountant for James D. Miller & Co. in New York.

Turning to the rubber field in 1941, he joined U. S. Rubber Reclaiming, then in New York, as office manager and manager of accounts, and subsequently was made an assistant secretary. During the 1946-52 period he served as a technical sales representative for the company, covering a good deal of the eastern territory. In late 1952, Mac left the rubber field to join the Steel City Lumber and Supply Co. in Lackawanna, N. Y., as treasurer. He left this connection to join our staff.

Mac MacConnell has a host of friends in the rubber industry. He is married, has no children, and is currently living in Northern New Jersey.

Barrett Names Cole & DeGraf

Barrett Division, Allied Chemical & Dye Corp., has announced that Cole & DeGraf will sell, service and stock its "Cumar" resins in San Francisco, Calif. In making the announcement, Barrett stated that this additional representation will give users of these resins better service than has been offered previously. "Cumar" resin is a coal-tar product used in the manufacture of rubber products and such other materials as adhesives, floor tile, waterproofing materials, varnishes, etc.

Reports on A-C Polyethylene

The Semet-Solvay Division of the Allied Chemical & Dye Corp., New York, N. Y., reports that A-C Polyethylene, employed with marked success in commercial rubber processing operations for the past five or six months, has proved to be an excellent mill and calender release agent for neoprene and Hypalon compounds. This polymer, the company states, is considered a superior lubricant for use especially when roll temperatures exceed 140°F. Processors advise, the company said, that A-C Polyethylene is effective at elevated temperatures. With Neoprene Type WHV, easier mill handling is noted at temperatures as high as 200°F. With Neoprene Type WRT thread compound, the product eliminates roll sticking when calenders are at temperatures of 165° to 225°F. There is no shrinking, and the finish of the calendered sheet is quite smooth. Further, the product has no adverse effect on curing. Easy sheet release of Hypalon stock from rolls at temperatures of about 225°F. is also reported, and because "nerve" is reduced, a smooth sheet is produced that does not shrink in cooling or in subsequent curing. This lack of shrinkage is especially important in the use of Hypalon tank linings which can be calendered and then cured in place, the company reports.

Davidson Mold Lubricants

Davidson Products Co., New Canaan, Conn., has announced the availability of two new mold lubricants, "ML-1028-2C" and "ML-1027-2C." Both of these mold lubricants are sold in a double concentrated solution for the sake of economy and both will go into solution, in their concentrated form, in even the hardest water. ML-1028-2C is a general purpose mold lubricant being used, at the present time, by many companies producing floor tile, soling stock and mechanical goods. ML-1027-2C is especially designed for foam and sponge rubber. The company has also announced the availability of two new mold cleaners, "CA-301" and "CA-302." The first of these two products is a two-phase cold dip tank cleaner, while the second is a single phase solvent for cleaning latex lines and for dissolving deposits of latex from floors, screens, pans, conveyors, etc.

Diamond PVC-50 UL Approved

Underwriters' Laboratories, Inc., has completed tests and found "Diamond PVC-50" acceptable as an interchangeable basic resin for use in all UL-listed vinyl electrical compounds, according to the Plastics Division of the Diamond Alkali Co., Cleveland, Ohio. New, Diamond-developed insulating compounds for T and TW building wire and 80°C. appliance wire have been submitted and were accepted by UL, the manufacturer reports. While Diamond does not supply formulated compounds for these specific applications, processors and fabricators may secure formulas and other data covering these newly developed electrical compounds by writing the company's Plastics Division, 300 Union Commerce Building, Cleveland 14, Ohio.

PROMISING INDUSTRY PERIOD FORESEEN BY P. W. LITCHFIELD

Private control of the nation's synthetic rubber producing facilities ushers in a "bright and promising new era" for the rubber industry, P. W. Litchfield, board chairman of the Goodyear Tire and Rubber Co., said recently. Rubber manufacturers never before have been in such a favorable position to bring boldness and confidence to forward planning, Mr. Litchfield writes in a current "Notes on America's Rubber Industry," entitled "A New Look for Rubber."

"Price and supply, the underpinnings of the industry, have gained a new firmness," the industry's dean points out. "Hazards to our national security have been materially relieved. There is a clear likelihood that the economies of those countries of the Far East which are dependent upon natural rubber will become more stable."

Mr. Litchfield defines the key word in the "new look" for rubber as "stability." "In my more than 50 years of close association with the industry, basic uncertainties have been the rule," he writes. "With our major source of supply situationed half way around the world, we have been at the mercy of forces beyond our control. Government cartels, invading armies, submarine warfare and civil unrest in the rubber-growing areas have been among our recurring problems. But now, with the development of the synthetic rubber industry, the sharp edge of this Damoclean sword has been dulled."

Estimates Need for Natural

Only small segments of the total output of rubber goods specifically require either natural rubber or synthetic, he continues. "We can be entirely comfortable as long as we can obtain natural rubber for 25% of our total needs. Henceforth, then, natural and synthetic rubber will compete on equal terms. The most economical-to-use material will heavily influence the market price of the other."

With present world supply of both natural and synthetic estimated at 3,018,000 long tons a year, current demand is at the rate of 2,705,000 long tons, according to the Goodyear chairman. The balance between supply and demand is delicate and temporary, he asserts, and demand is expected to increase substantially in the years to come. "Since there is a span of seven years between planting and harvesting natural rubber," he adds, "it is obvious that we must look to an expansion in the synthetic rubber industry to meet these increased demands."

Mr. Litchfield believes that the nation's stockpile of natural rubber has been built up to the point of adequacy to sustain military and essential civilian demands for a five-year emergency. He cautions, however, that close cooperation between industry and government will be necessary to rotate rubber stocks in and out to avoid deterioration and assure uniformity of quality.

"The point to be remembered here is that there are certain risks and increased costs involved for private industry in buying rotation rubber from the government as compared to buying fresh imports. When a rubber manufacturer buys his supplies directly, he can be more certain of uniform quality—of getting exactly what he is paying for. Grades now in the government stockpile are not entirely uniform."

The same logic which created a stockpile of natural rubber should be applied to the establishment of a stockpile of synthetic rubber, he suggests. "A military or political action which would cut off our own supply of natural rubber quite obviously would cut off the supply to our allies. It would compel our allies quickly to turn to us for large supplies of synthetic to meet their acute needs. Such a sudden and heavy additional demand could be beyond existing productive capacity."

Mr. Litchfield expresses concern that the growing of natural rubber will not expand in pace with our increasing needs although several companies, including Goodyear, have new rubber plantings in progress in the Western Hemisphere. He recommends the acceleration of such programs because the total availability of natural rubber will fall short of requirements in the not too distant future and the United States and our allies can again be cut off from natural rubber sources by a Communist onslaught upon Southeast Asia.

Even without an international emergency, he observes, we may be called upon for increased exports of synthetic should natural rubber prices reach excessive levels and place foreign made products at a competitive disadvantage in the world markets.

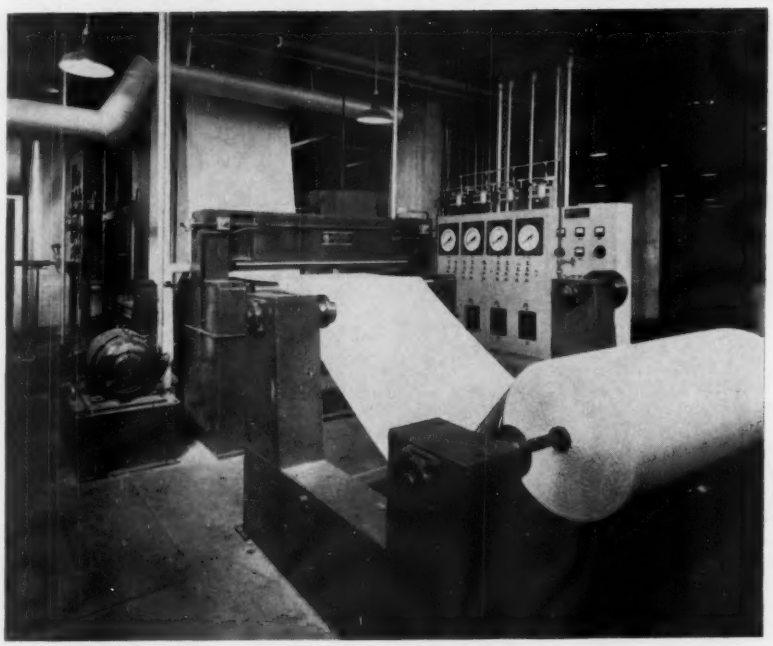
Benefit to Rubber Growers

The rewards of rubber's "new era" will not be confined to America alone, Mr. Litchfield contends. High among the beneficiaries will be the rubber-growing countries where the economic balance has been historically subject to violent upswings and declines with the wide fluctuations of natural rubber prices.

"As prices tend to stabilize at an acceptable level, it is logical to expect that conditions within those countries will be on a sounder and more satisfactory basis for their peoples," he concludes. "This should in turn enhance our own international standing in that very important outpost of the free world."

Baldwin SR-4 Load Cells and Load Beams for electrical measurement of weight and force are described in a new, 20-page bulletin available from Baldwin-Lima-Hamilton Corp., Philadelphia 42, Penna. Request Bulletin No. 4301.

NEW LATEX DIP UNIT INSTALLED BY ARMSTRONG RUBBER AT WEST HAVEN



The installation of a $750,000 latex dip unit in its West Haven, Conn., plant, has been announced by the Armstrong Rubber Co. Built to Armstrong specifications, the unit covers two floors and dips the rayon or nylon tire cord, stretching it and tempering it in one continuous automatically controlled operation. Outstanding features of the new equipment include its ability to stretch synthetic fibers under tensions up to 10,000 pounds during the dipping and drying operations. The new latex dip unit, according to the company, eliminates danger of heat growth by giving synthetic fibers the extremely high tensions necessary to take the stretch out of the material before it goes into the tire. Another innovation of the unit is gas fired ovens that have proven to be more efficient than the former steam method of drying. Four gas burners control these drying ovens, the company states.

100,000th Wire Cord Tire

Firestone Tire & Rubber Co., Akron, Ohio, has announced that it will manufacture its 100,000th wire cord tire in May of this year. The company has spent thirteen years in engineering and producing truck and bus tires that are built with steel wire cords instead of rayon or nylon cords used in most tires. High-speed bus and truck tires that are manufactured with the steel wire cords are said to be the safest and strongest pneumatic tires ever built. The company is said to have invested well over $1,000,000 in research since 1943 on development work to make the wire cord tire the safest tire that can be used for truck and bus transportation. The firm states that because of the greater strength of steel cord, wire cord tires require only four plies. These four plies embedded in rubber make a tire stronger than one using twelve or fourteen plies of fiber material. This leaves more room for tread rubber. Heavier treads can be used to provide greater mileage than possible with fiber cords and without danger of blowouts due to deterioration of the cord body. The tire bodies can be retreaded repeatedly. It is said that original tread mileage of 300,000 miles is not unusual with wire cord tires. Company officials predict that within two or three years further refinements to the wire cord tire will give it an original tread life of 500,000 miles.

Scrap Institute Elects Tanney

Sam Tanney (Tanney-Costello) was elected president of the Scrap Rubber and Plastics Institute of the National Association of Waste Material Dealers, Inc., at its March 21 meeting in Chicago, Ill. The meeting was held in conjunction with the 42nd Annual Convention of NAWMD. Mr. Tanney succeeds Milton Kushkin (A. Schulman). Sidney Friedman (H. Muehlstein) was elected vice-president, the post formerly held by Mr. Tanney. Manny Migdoll, director of public relations for NAWMD, succeeds the late George W. Reid as secretary-treasurer of the Institute. Current conditions and the future outlook in the scrap rubber and plastics field were discussed at the meeting, and suggestions were made for plans and projects for the Institute similar to those that have met with success in certain other commodity divisions of NAWMD.

Interesting Rubber Articles

In the current issue of "Rubber Developments," publication of the Natural Rubber Bureau, 1631 K Street, N.W., Washington 6, D. C., there appears a number of interesting articles, one of which is on the subject of liquid rubber. The author states that liquid rubber offers advantages for a growing number of applications, and he provides a good deal of practical information on liquid rubber and how it can be used. Another article in the current issue concerns itself with the improvement of the service performance of natural rubber at low temperatures. Copies of the issue in which these articles appear are available from the Natural Rubber Bureau without charge.

Adam Appointed Sales Manager

Lloyd C. Adam

Erie Engine and Manufacturing Co. has announced that Lloyd C. Adam has been appointed sales manager in charge of the Rubber and Plastics Machinery Division. Mr. Adam, who was previously associated with Erie Engine, has returned to his former position after an absence of a year and a half. His previous experience with the company embraced some ten years and he now rejoins the company as a part of its executive reorganization.

Named Aircraft Sales Manager

Appointment of Alvin O. Fuhrmann as national aircraft sales manager of the Adhesives and Coatings Division has been announced by the Minnesota Mining & Manufacturing Co. The new Aircraft Department has been organized to better serve the specialized and highly technical needs of the growing aircraft industry. Since 1953, Mr. Fuhrmann has been national industrial sales manager for adhesives and coatings. He joined 3M in 1950 as merchandising manager, government trades. Mr. Fuhrmann will continue to headquarter at 3M's Detroit office; however, current plans call for the establishment of aircraft sales and product development headquarters in Los Angeles, Calif. 3M's adhesives and coatings plants are located in Detroit and Wayne, Mich., Bristol, Penna., and Los Angeles, Calif.

Mansfield Stock Issue Approved

At a recent meeting, stockholders of the Mansfield Tire & Rubber Co., Mansfield, Ohio, approved the issuance of $2,500,000 of new preferred stock to be sold to institutional investors. Company officials stated that the major portion of the proceeds will be added to working capital and the balance will supply funds for investment in a new Canadian plant in which the company is said to have a 50% interest. A portion of the proceeds will also be applied to an additional investment in the Copolymer Corp., in which Mansfield Rubber is a participant. Stockholders re-elected all directors who, in turn, re-elected all officers of the company.

Offers High Polymer Course

The Department of Chemical Engineering of the University of Michigan, Ann Arbor, Mich., will offer an intensive course on "Properties and Structures of High Polymers in Solution" from July 18 to 23. The objective of the course is to provide an opportunity for those engaged in polymer work to appraise the developments in polymer solutions and to make actual measurements. A further objective is to provide the opportunity to discuss and interpret experimental results in the company of experts in the subject. The outline of the course covers such subjects as basic concepts of the structure and configuration of large molecules; behavior of high polymers in solution; experimental measurements, including viscosity, light scattering, infrared absorption, sedimentation and diffusion, and osmotic pressure; and, interpretation of data. The staff for the course will include L. M. Hobbs (University of Michigan), F. Bueche (University of Wyoming), L. H. Cragg (Hamilton College), Samuel Krimm (University of Michigan), and Robert Simha (New York University). Registration, limited to 50 persons, will be accepted until May 18. Correspondence should be addressed to L. M. Hobbs, Department of Chemical and Metallurgical Engineering, University of Michigan, Ann Arbor, Mich.

Establishes Fortisan-36 Price

Celanese Corp. of America, New York, N. Y., has established a price of $1.50 a pound, delivered East of the Mississippi River, for "Fortisan-36" yarn, the new super-strong industrial rayon fiber developed by the company for use in power transmission belting, high pressure hose, fire hose, conveyor belts and other applications requiring high strength and dimensional stability. At the outset the fiber will be available in 800 denier (the individual fiber size being 1 denier per filament) with an 0.8 twist on 4-pound cones. However, it is anticipated that heavier denier yarn, as well as zero twist yarn, will be produced later. Plans are also under way for the delivery of yarns on beams, in addition to cones. Equipment and machinery are now being installed at the Rome, Georgia, plant of the company for the production of Fortisan-36 fiber. Initial output is scheduled for the fourth quarter of the year.

U. S. Rubber Appointments

William L. Johnson has been named assistant manager of truck tire sales, U. S. Tires Division, U. S. Rubber Co., New York, N. Y. E. B. Reynolds succeeds Mr. Johnson as supervisor of sales training. Mr. Reynolds will be responsible for the Training Department's activity concerned with the training and development of the company's Tire Division personnel. P. H. Kelley, director of training for the Tire Division, has announced that H. B. Sharer has been appointed supervisor of distributor training. C. W. Maier, who continues as supervisor of sales personnel, will take on additional duties in an administrative and coordinating capacity.

GORDON RESEARCH CONFERENCE SCHEDULED FOR AUGUST 1 TO 5

The 1955 Gordon Research Conference on Elastomers will be held on August 1 through 5 at Colby Junior College, New London, New Hampshire, under the sponsorship of the American Association for the Advancement of Science. A. M. Bueche will serve as chairman of the conference, and B. S. Biggs will serve as vice-chairman. The purpose of the program is not to review the known fields of chemistry, but primarily to bring experts up to date on the latest developments, analyze the significance of these developments, and to provoke suggestions as to underlying theories and profitable methods of approach for making new progress.

Requests for attendance at the conference, or for any additional information, should be addressed to W. George Parks, Director, Department of Chemistry, University of Rhode Island, Kingston, R. I. From June 10 to September 2, 1955, mail should be addressed to Colby Junior College, New London, N. H.

There follows herewith a listing of the papers to be presented at the Gordon Conference on Elastomers, together with their authors:

"Recent Advances in Elastomers" by Harry L. Fisher.

"Review of Isocyanate Chemistry" by J. J. Verbanc.

"Chemigum SL Polyurethane Elastomers" by N. V. Seegar.

"Adiprene Urethane Rubber" by J. A. Nelson.

"Sulfur Vulcanization of Vinyl Substituted Polysiloxanes" by K. E. Polmanteer and R. J. Koch.

"The Effect of Different Backbone Structures on the Properties of Isocyanate-Linked Elastomers" by E. G. Williams.

"The Molecular Basis of Viscoelastic Behavior" by R. S. Marvin.

"Second Order Transitions of Polymers —Plasticizers and Blends" by L. Breitman and L. A. McLeod.

"The Tensile Strength of Elastomers" by G. R. Taylor.

"Attempted Correlation Between Abrasion Resistance and Breaking Strength of Acrylic Resins" by F. R. Eirich and J. Cornell.

"Reinforcement: Physical and Chemical Approaches" by D. Parkinson, A. F. Blanchard, J. W. Watson and C. H. Leigh-Dugmore.

"Behavior of Rubber Vulcanizates in Tension" by F. L. Roth, G. M. Martin, and R. D. Stiehler.

"Filler Reinforcement of Butyl Rubber" by A. M. Gessler.

"Reinforcement of Acrylic Elastomers" by P. Fram.

"The Effect of High Rates of Elongation on the Stress-Strain Properties of Elastomers" by F. D. Snyder.

Armour and Co. has issued a booklet entitled "Armeens", which describes primary and secondary amines. Address requests to the Chemical Division, 1355 W. 31 St., Chicago 9, Ill.

Introduces Fedco Tackifiers

A new line of emulsions especially suitable for tackifying and adhesive purposes has been announced by the Federal Latex Corp., Brooklyn, N. Y. Designated as "Fedco Tackifiers," they comprise a variety of emulsions which have been developed primarily for modifying latex for use in adhesive formulations. There follows herewith, data on five of these products:

"Fedco Tackifier No. 11" finds use as a tackifier with natural and synthetic latex for making pressure sensitive window displays; decorative displays; dry stick wall coverings, and splicing adhesives. Its high solids content makes for stable yet fast breaking formulas. It is white in color, 66% solids and has a viscosity of 14,000 cps.

"Fedco Tackifier No. 66" finds use as a tackifier where a film of very strong pressure sensitive properties of short duration is required. It can be used with natural and synthetic latices and is suggested for lasting and sock lining adhesives in the shoe industry; dry stick operations on leather in handbag and belt work, and cellulose acetate adhesives. It is white in color, 48% solids and has a viscosity of 1400 cps.

"Fedco Tackifier No. 40" imparts good adhesion to most rubber dispersions. It helps develop a very strong bond, especially for adhering cloth to cloth in combining work. It is tan in color, 49% solids and has a viscosity of 4000 cps.

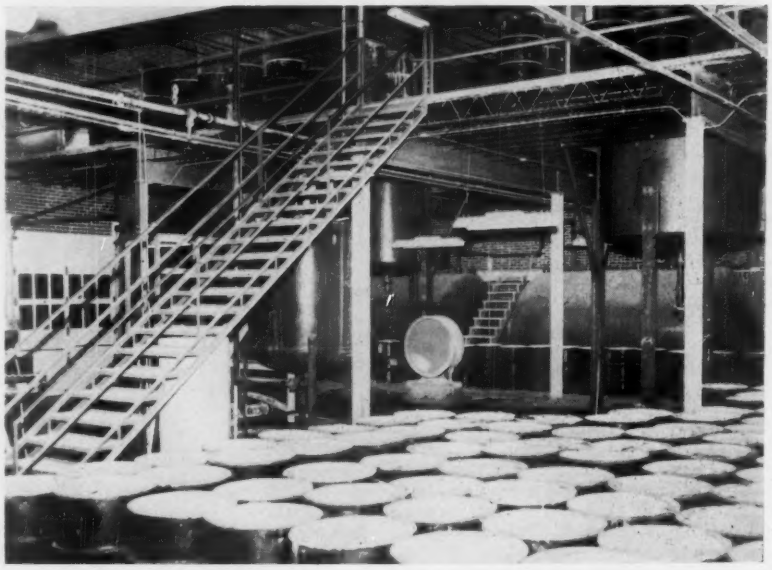
"Fedco Tackifier No. 26" is a very low priced tackifier. It can be used with most latices as an inexpensive extender imparting strong adhesive properties. Its high solids content is useful in fast breaking systems. It is brown in color, 64% solids, and has a viscosity of 1000 cps.

"Fedco Tackifier No. 80A" is said to be an excellent tackifier for quick aggressive grab and exceptionally strong bond. It finds use with both natural latex and GR-S. It is recommended for the formulation of adhesives where instantaneous grab is required. It is white in color, 62% solids and has a viscosity of 22,000 cps.

Pliolite-Backed Fabrics

Burlington Decorative Fabrics, Burlington Industries, Inc., 350 Fifth Avenue, New York, N. Y., is manufacturing fabrics with a "Pliolite" latex backing for automotive and furniture upholstery, mattress tickings, handbags, footwear and similar products. The new latex treatment strengthens fabrics in all directions and gives them the ability to retain shape, even after severe stretching. Barely visible, the latex coating adds durability and improves fabric drape and body. Binding the individual fibers in place, it reduces raveling and improves tear and snag resistance, even in loosely woven textiles. These properties make the backed fabric ideal for covering in the automotive and home furnishing fields. "Airfoam" in particular is now upholstered easily with the fabric. Unlike non-skid carpet backing or built-in underlay, the new coating is light in weight yet gives adequate strength without destroying flexibility.

DEE'S ADHESIVES COMPLETES NEW LATEX COMPOUNDING PLANT IN GEORGIA



Dee's Adhesives and Chemicals, Lynn, Mass., has announced the completion of a new plant for latex compounding in Dalton, Ga. The building, of two-story brick construction, occupies a two-acre site and has a newly-completed siding on the Southern Railroad. The new plant provides ample facilities for receiving and storing several types of bulk latex and the mixing and dispersing equipment, all of stainless steel, is geared for the increasing business which made this new installation necessary. A well-equipped and well-staffed laboratory has been set up in the new building to handle necessary compound control and development problems.

To Market Fatty Acids

Chemical Division of General Mills, Inc., Minneapolis, Minn., and Crosby Chemicals, Inc., have announced an arrangement whereby General Mills will market the major portion of a complete line of tall oil fatty acids to be produced by Crosby Chemicals, under General Mills' "Aliphat" brand. General Mills' Chemical Division will continue to manufacture at Kankakee, Ill., tallow, soya, cottonseed, coconut, corn and other vegetable fatty acids. Crosby has started producing tall oil fatty acids at their plant at Picayune, Miss., about the middle of April. Their new, modern, up-to-date installation, with large capacity, is especially designed for tall oil fractionation and distillation of fatty acids with extremely low rosin acids content. The Chemical Division of General Mills will handle the distribution of the complete line of fatty acids, as well as fatty acid derivatives and polyamide resin through its district sales offices and sales representatives. General Mills will carry warehouse stocks throughout the country.

St. Clair Plans Expansion

St. Clair Rubber Co., Detroit, Mich., has announced a $500,000 expansion program at its Maryville, Mich., plant. The company has purchased three buildings at the former Dow Chemical Co. site in Marysville. The Adhesive Division of the company will be moved to this site. The company also plans to construct an addition to its main plant to house the shipping and receiving additions. One of the smaller buildings on the former Dow site will be used for a new research and development laboratory. During the past two years, the company has spent some $250,000 on new equipment and plant rearrangement. In addition to adhesives, the firm produces molded mechanical goods and coated fabrics. The company presently employs about 400 persons. When additions are complete, the company expects to employ an additional 50 persons.

Goodrich Officers Re-Elected

Following the recent annual meeting of the stockholders of the B. F. Goodrich Co. in New York City, directors of the company re-elected all officers. Returning to their posts were John L. Collyer, chairman of the board; W. S. Richardson, president; J. W. Keener and Arthur Kelly, vice-presidents; Frank K. Schoenfeld, vice-president-research; R. G. Jeter, secretary and general counsel; E. A. Stevens, treasurer, and H. V. Gaertner, controller.

Enters Baby Pants Field

Pioneer Rubber Co., Willard, Ohio, has entered into the production of baby pants using a new cast vinyl-on-rayon fabric developed by the Industrial Rayon Corp. Industrial Rayon has licensed Pioneer Rubber to manufacture the baby pants under the name "Rock-A-Dri." Officials of Pioneer Rubber state that if the pants are punctured with a pin there is no tear-out. In addition, the fabric is completely waterproof.

Wendrow Named Chief Chemist

B. R. Wendrow

B. R. Wendrow has been appointed chief chemist in the Development Department of the U. S. Rubber Reclaiming Co., Inc., Buffalo, N. Y. Mr. Wendrow joined the company in 1946 as a chemical engineer in the Research Department. During World War II, he served in the Corps of Engineers of the U. S. Army as a chemical engineer and was assigned to the Manhattan Engineer District at Chicago, Ill.; Oak Ridge, Tenn., and Los Alamos, N. M. Mr. Wendrow received his B.Ch.E. degree from the Cooper Union Institute of Technology in 1940. He is a member of the American Chemical Society and its Division of Rubber Chemistry, as well as the Buffalo Rubber Group.

Synthetic Products Expanding

A 30,000 square foot addition to the present Synthetic Products Co. plant in Cleveland, Ohio, is now under construction, to increase the manufacturing and warehouse area. The plant expansion was made necessary for the development of new and improved vinyl heat and light stabilizers for the vinyl plastic industry, and the increased list of products of stearates and specialties. At the same time, Garry B. Curtiss, vice-president and general manager, disclosed the expansion of the firm's Technical Service Department, to handle the heat and light stability problem more effectively and efficiently. Raymond J. O'Hara is chief chemist in charge of the Vinyl Stabilization Division.

Kinzel Elected Vice-President

Dr. Augustus B. Kinzel has been elected vice-president-research of the Union Carbide and Carbon Corp., New York, N. Y., succeeding Dr. George O. Curme, Jr. Dr. Curme, who is retiring as vice-president of the corporation, will continue as a director. Dr. Kinzel has been actively engaged in research work with Union Carbide since 1926, when he joined Electro Metallurgical Co. as a research metallurgist. He became chief metallurgist of the laboratories in 1931, and a vice-president of Electro Metallurgical in 1944. He was appointed director of research of Union Carbide in July, 1954.

Joins Chemical Sales Department

William Howlett Gardner, previously with the New Products Division, National Aniline Division, Allied Chemical & Dye Corp., New York, N. Y., is now attached to the Chemical Sales Department of that company. In his new position, Dr. Gardner will be responsible for the preparation of technical literature on National's new chemicals which include adipic acid, caprolactam monomer, isocyanates and other organics. In addition, he will act as a technical representative in the sale and application of National Aniline chemicals. Prior to joining National Aniline in 1943, Dr. Gardner was chief of the Chemical Materials Branch, Conservation Division, War Production Board at Washington, following previous work as a chemical educator at the Polytechnic Institute of Brooklyn, where he was research professor of chemical engineering and supervisor of the Science Research Bureau, specializing in the fields of shellac, resins, paints, plastics and other polymers.

Discusses Yarn Evaluation

A new yarn evaluation method which eliminates plying and the use of adhesive was discussed in New York recently by G. D. Mallory, section head in charge of fabric research for the Goodyear Tire & Rubber Co. Mr. Mallory, addressing the Tire Cord Sub-Committee of the American Society for Testing Materials, described how fatigue properties of new and unknown yarns can be evaluated as compared to current and established yarns. He revealed that the new process permits an evaluation with just a few hundred yards of yarn. He also discussed the effect of yarn size and moisture content. The title of the paper presented by Mr. Mallory was "Preliminary Studies on Procedure for Estimating the Fatigue Life of a New and Unknown Yarn in Rubber."

Armstrong Cork Splits Stock

Stockholders of the Armstrong Cork Co., Lancaster, Penna., have approved a three-for-one split of the company's common stock. The split increases Armstrong's authorized common stock to 15,000,000 shares with par value of $1.00. As of April 22, the company said it had 1,642,742 shares outstanding and 5,301,669 shares of the new stock will be listed on the New York and Pittsburgh Stock Exchanges to cover these shares as well as those held in reserve for option.

To Deliver Marburg Lecture

Walter J. Hamburger, director of the Fabric Research Laboratories, Inc., Boston, Mass., will deliver the 29th Edgar Marburg Lecture at the 1955 Annual Meeting of the American Society for Testing Materials at Chalfonte-Haddon Hall, Atlantic City, N. J., on June 29. Dr. Hamburg's lecture title will be "A Technology for the Analysis, Design and Use of Textile Structures as Engineering Materials."

WASHINGTON HEARS SPENCER ON TRENDS IN POLYETHYLENE

The March 16th meeting of the Washington Rubber Group held in the Pepco Auditorium in Washington, D. C., featured an address by Dr. John Brown, manager of research and development for the Spencer Chemical Co. Dr. Brown spoke on "New Trends in Polyethylene." Dr. Brown reviewed the polyethylene supply and demand situation and reported that in 1954, supplies finally caught up with U.S. demand.

By 1957, Dr. Brown estimated that the production capacity of the industry will be over 600,000,000 pounds a year. Of this amount, about 45,000,000 pounds will be available from Spencer Chemical. Spencer uses a process licensed by Imperial Chemical Industries, Ltd.

The speaker explained that polyethylene is a thermoplastic hydrocarbon, chemically related to paraffin but much stronger and tougher besides having a much higher melting point. It can be made in several grades that differ in properties mainly as a function of molecular weight—the greater being the more heat resistant and, consequently, requiring higher processing temperatures.

Practically, polyethylene is a saturated hydrocarbon and therefore does not respond to cure as rubbers do. It is processed like other thermoplastics by extrusion, blow-molding and injection molding. Calendering has limitations because unsupported calendered sheet is "tender" when hot. This apparent shortcoming is more than made up by the ease with which excellent film or sheet can be made by the extrusion-blowing technique, or by extrusion through flat dies.

Promising new developments portend an interesting future for polyethylene. It appears that it will become available in several varieties and physical forms, in much the same way as the vinyls. Studies on polymer structure and polymerization technique are bearing fruit in polyethylene polymers of greater heat resistance, thus extending their usefulness. The low-pressure types may appear commercially quite soon. Carbide & Carbon, as well as Phillips are known to be working with the new German method. Dr. Brown believes that "the future looks bright" and the "big polyethylene gamble" will pay off.

Gulf Forms Chemical Department

Gulf Oil Corp., Pittsburgh, Penna., has formed a Chemical Department to handle the company's expanding chemical activities. The new department will have overall responsibility for promoting Gulf's interests in the chemical field. It will have the specific duty of marketing chemical products and will also be responsible for the guidance of chemical research and process engineering and the recommending of future chemical projects. L. O. Crockett has been appointed general manager of the Chemical Department. He will be assisted by Dr. Alexander Lewis, Jr., as manager of chemical marketing, and by V. N. Hurd as director of chemical development.

Coming Events in the Rubber Industry

May 30-June 1. Chemical Institute of Canada, 38th Annual Conference, Quebec City, Can.

June 2. Rhode Island Rubber Club, Summer Outing, Pawtucket Country Club, Pawtucket, R. I.

June 4. Southern Ohio Rubber Group, Summer Outing, Inland Activities Center, Dayton, Ohio.

June 4-5. Los Angeles Rubber Group, Summer Outing, Coronado Island, Calif.

June 9. New York Rubber Group, Summer Outing, Doerr's Grove, Millburn, N. J.

June 10. Fort Wayne Rubber and Plastics Group, Summer Outing.

June 10. Washington Rubber Group Golf Outing, Bethesda Country Club, Bethesda, Md.

June 16. Buffalo Rubber Group, Summer Outing, Lancaster Country Club.

June 17. Akron Rubber Group, Summer Outing, Firestone Country Club.

June 17. Boston Rubber Group, Summer Outing, Andover Country Club, Andover, Mass.

June 19-23. American Society of Mechanical Engineers, Diamond Jubilee Semi-Annual Meeting, Hotel Statler, Boston, Mass.

June 21. Buffalo Rubber Group, Golf Outing, Lancaster Country Club, Lancaster, N. Y.

June 24. Detroit Rubber and Plastics Group, Annual Golf Outing, Western Golf and Country Club, Detroit, Mich.

June 26-July 1. American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

July 22. Chicago Rubber Group, Golf Outing.

Aug. 19. Philadelphia Rubber Group, Summer Outing, Manufacturers' Country Club, Oreland, Penna.

Sept. 17. Connecticut Rubber Group, Summer Outing.

Sept. 22. Southern Ohio Rubber Group, Fall Meeting, Engineer's Club, Dayton, Ohio.

Sept. 23. Northern California Rubber Group.

Sept. 25. Northern California Rubber Group, Annual Family Summer Outing.

Sept. 29. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Oct. 4. Buffalo Rubber Group, Fall Meeting, Hotel Westbrook, Buffalo, N. Y.

Oct. 4. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Oct. 7. Chicago Rubber Group.

Oct. 7. Detroit Rubber and Plastics Group, Fall Meeting, Detroit-Leland Hotel, Detroit, Mich.

Oct. 7. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Oct. 14. Boston Rubber Group, Fall Meeting, Somerset Hotel, Boston, Mass.

Oct. 14. Northern California Rubber Group.

Oct. 28. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Oct. 28. Philadelphia Rubber Group, Fall Meeting, Poor Richard Club, Philadelphia, Penna.

Nov. 1. Los Angeles Rubber Group, Statler Hotel, Los Angeles, Calif.

Nov. 2-4. Division of Rubber Chemistry, A.C.S., Fall Meeting, Bellevue-Stratford Hotel, Philadelphia, Penna.

Nov. 3. Rhode Island Rubber Club, Fall Meeting, Pawtucket Country Club, Pawtucket, R. I.

Nov. 10. Northern California Rubber Group.

Nov. 11. Chicago Rubber Group.

Nov. 13-18. American Society of Mechanical Engineers, Diamond Jubilee Annual Meeting, Hotel Congress, Chicago, Ill.

Nov. 18. Connecticut Rubber Group, Fall Meeting.

Dec. 1. Fort Wayne Rubber and Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Dec. 7. Buffalo Rubber Group, Xmas Party, Buffalo Trap and Field Club, Buffalo, N. Y.

Dec. 9. Detroit Rubber and Plastics Group, Annual Christmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 9. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 10. Southern Ohio Rubber Group, Xmas Party, Miami Valley Golf Club.

Dec. 16. Boston Rubber Group, Xmas Party, Somerset Hotel, Boston, Mass.

Dec. 16. Chicago Rubber Group.

Dec. 16. Los Angeles Rubber Group, Xmas Party, Ambassador Hotel, Los Angeles, Calif.

Insular Chemical Formed

Insular Chemical Corp. is now constructing on its property at Hicksville, Long Island, what is said to be the first plant to be erected by independent plastic processors for the production of polyvinyl chloride. The major output of the new multi-million pound resin plant will go to Rubber Corp. of America, Hicksville, Long Island, and Ross & Roberts Co., Stratford, Conn. Each of these firms, prominent in the production of vinyl film and sheetings, owns a half interest in Insular. A three year engineering and develoment program, which preceded the plant construction, has brought into being several new vinyl resins not elsewhere available, some of which may be offered on the market for special applications. The new manufacturing facility, which will be a model of automatic control and materials handling, embodies the latest thinking in engineering design; it will be completed in the spring of 1956, but during this period, activities at the existing laboratory and pilot-plant building will continue at an augmented rate. Calendering grade resins are already available in semi-commercial quantities.

Acquires Advance Solvents

Carlisle Chemical Works, Inc., of Reading, Ohio, has acquired the Advance Solvents & Chemical Corp. of New York, N. Y., and its subsidiary companies. Advance Solvents is an important manufacturer of driers used in the paint and printing industries, of stabilizers and plasticizers used in the rubber and plastics industries, and of numerous specialty compounds. Manufacturing facilities are located in Jersey City, N. J., and in addition to its domestic operation the company has a Canadian subsidiary (Advance Solvents & Chemical Corp. of Canada, Ltd., St. Johns, Que.), and carries on an export business through its subsidiary, Advance International, Ltd. By this acquisition, Carlisle further expands its operation in the field of chemical additives and Advance gains access to the manufacturing and research facilities of Carlisle. Because the activities of the two companies are complementary rather than overlapping, the two companies can gain the full benefits of broadened marketing, research and manufacturing resources.

Heads Wire and Cable Department

David A. Hinton, associated with the National Electric Products Corp., Pittsburgh, Penna., since 1936, has been named manager of the Wire and Cable Department. In his new position, Mr. Hinton will be responsible for the coordination of all wire and cable sales efforts with sales personnel and the company's Design and Production Departments. He will also be charged with sales planning for new products. Before joining the company, Mr. Hinton had been associated with the Bell Telephone Co. and General Motors. Mr. Hinton is a 1931 graduate of the University of Pittsburgh with a B. S. degree in chemical engineering.

Smart Joins Harchem Division

Frank H. Smart

Frank H. Smart has joined the Harchem Division of Wallace & Tiernan Inc. (successor to W. C. Hardesty Co., Inc.), as assistant to the director of sales. Mr. Smart will cover the steadily expanding sales, sales promotion and sales development activities of the Harchem organization with special emphasis on sales of plasticizers and sebacic acid. Before joining the Harchem Division, Mr. Smart was with Whittaker, Clark & Daniels, Inc., as an area sales manager. He is a graduate of the New York University School of Commerce. Mr. Smart will have his headquarters at the main office of the Harchem Division at 25 Main St., Belleville 9, N. J.

Winquist and French Reassigned

A. D. Winquist, Jr., and Marcus French, for the past several years engaged in chemical research with the New Products Division of the National Aniline Division, Allied Chemical & Dye Corp., New York, N. Y., have been assigned to the Chemical Sales Department of that company. Mr. Winquist will be attached to the Sales Service Section while Mr. French will act as a technical sales representative. The new assignments are part of an expansion program within National Aniline Division sales and technical service activities incident to completion of new facilities for production of adipic acid, caprolactam and other chemicals at Hopewell, Va., and a new plant at Moundsville, West Va., for maleic anhydride, fumaric acid, aniline and isocyanates.

Purchases Ellis Allen Co.

Robert B. Arbuckle, president of Wild & Stevens, Inc., Newton Upper Falls, Mass., has announced the purchase of the Ellis Allen Co. of Woburn, Mass., manufacturers of mechanical rubber products for industry. The Allen company, with 20,000 square feet of manufacturing facilities and 50 employees, will be consolidated with the parent company as soon as practical. It will be operated as the Rubber Manufacturing Division of Wild & Stevens, Inc.

FTC Reviewing Sales Methods

A Federal Trade Commission official told Congress recently that a review of an investigation of the sales and distribution practices of three major rubber companies would be before the commissioners within six months. Joseph E. Sheehy, director of the FTC's Bureau of Litigation, testified before a House small business subcommittee, which is holding hearings on alleged coercive and discriminatory practices against gasoline station operators by major oil and rubber companies. He said the investigation of complaints relating to the distribution of tires, batteries and auto accessories through retail gasoline stations was started in 1949. He said he would not name the companies involved, because the case is not completed, but said he thought it would be up for review before the FTC commissioners within six months. He said investigators studied the legality of the system of commissions the rubber companies have with some oil companies for providing, in effect, retail outlets for the rubber companies.

Akron Presform Appoints Beal

T. A. Miller, president of Akron Presform Mold Co., Cuyahoga Falls, Ohio, has announced the appointment of Carl L. Beal as technical consultant and eastern representative. The company designs and manufactures production rotational plastisol casting machines, molds, dispensing units and forms for latex and plastisol dipped articles. Mr. Beal's broad experience in the rubber and plastics industry has included service as technical consultant or chemical engineer with the Ideal Toy Corp., Behr-Manning, B. F. Goodrich, American Anode, and Eastman Kodak. He is holder of the N. A. M. "Modern Pioneer" award for his development of patented processes. With headquarters at Kendrick Lane, R. D. 4, Huntington, L. I., Mr. Beal will make Akron Presform's services and consultations more readily available to firms in the eastern area.

Durez Sale to Hooker Voted

Merger of Hooker Electrochemical Co., of Niagara Falls, N. Y., and Durez Plastics & Chemicals, Inc., of North Tonawanda, N. Y., was approved by stockholders of both companies at their annual meetings on April 28. The merger will be consummated when counsel for Hooker files a certificate with the Secretary of State in Albany. Durez will lose its corporate name, but will operate as the Durez Division of Hooker. Under the merger agreement, Hooker purchases Durez by giving shareholders of that company a share-for-share exchange. There are 1,650,000 shares of Durez outstanding. The Hooker shares to be issued have a current market value of approximately $63,500,000. Durez was formed 33 years ago with capital of $57,000.

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NAMES IN THE NEWS

WILLARD C. GULICK, president of the International B. F. Goodrich Co., has been re-elected to the board of directors of the International Road Federation.

C. C. FULLER, associated with the Foxboro Co. since 1920, has been appointed vice-president. H. O. EHRISMAN, with the company since 1936, has been named general sales manager, and J. J. BURNETT, associated with Foxboro since 1925, has been named field sales manager.

HOWARD E. AMMERMAN, manager of the Service Department of the Goodyear Tire & Rubber Co., was honored at a dinner and presented with a service pin marking his thirtieth anniversary with the company.

THOMAS MELLON EVANS, president of the H. K. Porter Co., will receive the Eleventh Annual Parlin Memorial Award for "outstanding contribution to the field of marketing" on May 18 in Philadelphia, Penna. The Parlin lecture and award was founded in 1945 by the Philadelphia Chapter of the American Marketing Association.

HUGH C. LAND, associated with the Pennsylvania Salt Manufacturing Co. since 1946, has been named general manager of the Industrial Chemicals Division succeeding WILLIAM P. DRAKE, who recently was named executive vice-president.

DR. B. DAVID HALPERN has been named research director of the Chemical Division Laboratory of the Borden Co., Philadelphia, Penna. D. F. Gould has been appointed assistant to the vice-president and technical director of the division.

EUGENE G. SWART, vice-president and treasurer of the Flexible Tubing Corp., Guilford, Conn., has been elected a director of the company.

LYNN W. BAKER, assistant counsel for the Goodyear Tire & Rubber Co. at Akron, Ohio, has retired from the firm after almost 37 years of service.

MARTIN G. LEVENS, associated with the Columbia-Southern Chemical Corp. for nine years, has been named assistant district sales manager for the Philadelphia, Penna., office.

R. S. WILSON, vice-president in charge of sales of the Goodyear Tire & Rubber Co., has been elected an honorary member of Beta Gamma Sigma, national honorary society of commerce and business administration.

JANET M. COLE has joined the Analytical Laboratory of the Research Division, Goodyear Tire & Rubber Co., Akron, Ohio.

HERBERT R. BUCK has been transferred from the Staff Training Department of the Research Division, Goodyear Tire & Rubber Co., to the Process Engineering Section of the division.

JOSEPH F. HUTCHINSON, formerly assistant general manager of the Metal Products Division, Goodyear Tire & Rubber Co., has been appointed manager of the Automotive Engineering Division.

JOHN W. SHACKLETON, a member of the Planning Division, Polychemicals Department, E. I. du Pont de Nemours & Co., Inc., will enter Virginia Theological Seminary this fall to begin study for the Episcopal ministry. He has been with DuPont for 16 years.

GERALD REINSMITH, associated with the Narmco Metlbond Co. for the past year, has returned to government service. He has been named Chief, Applied Research Section, Research and Development Division, Headquarters Ordnance Weapons Command, Rock Island, Ill.

WILLIAM I. BURT, president of Goodrich-Gulf Chemicals, Inc., has been named to receive the Distinguished Alumnus Engineering Award of Ohio State University. Mr. Burt was graduated from Ohio State in 1917.

RENE OEHLER, formerly associated with the National Bureau of Standards, has joined the Victor Manufacturing and Gasket Co., Chicago, Ill., as senior research chemist.

JOHN S. BRICE has joined the Chemical Division of the Goodyear Tire & Rubber Co. as a field representative in the Southeastern territory. With headquarters in Atlanta, Ga., he will specialize in sales and service to the textile industry in the company's line of Chemigum, Pliolite and Pliovic latices.

WALTER PLATTE, formerly associated with the Pladel Corp. of St. Louis, Mo., has been named designer and stylist of all Koroseal materials for consumer application by the B. F. Goodrich Industrial Products Division.

A Koroseal conveyor belt in a spray booth at the trim plant of Ford Motor Co., Detroit, Mich., is credited with a 30% decrease in the over-all maintenance operation needed on the belt used for conveying trim panels.

Radio Corp. of America has issued an illustrated brochure on "The Electron Microscope." Write to Scientific Instruments, Building 15-1, Engineering Products Division, RCA, Camden 2, N. J.

Nesbit Joins Latex & Rubber

Jean R. Nesbit

Jean R. Nesbit, formerly associated with the U. S. Rubber Reclaiming Co. at Buffalo, N. Y., as assistant sales manager, has joined Latex & Rubber, Inc. of Baltimore, Md. In his new capacity, Mr. Nesbit will cover the eastern half of the United States representing the company on latex and solid rubbers. A graduate of Carnegie Institute of Technology with a degree in chemical engineering, Mr. Nesbit was associated with the Continental Carbon Co. from 1940 through 1947. During this time, he also served in the armed forces. In 1947, Mr. Nesbit joined U. S. Rubber Reclaiming, where he remained until his new appointment with Latex & Rubber.

Naugatuck Nitrex 2615

Naugatuck Chemical Division of the U.S. Rubber Co., Naugatuck, Conn., has announced "Nitrex 2615", a new latex said to offer good color, very high tensile, resilient "snappy" film, excellent solvent resistance, good low temperature flexibility, and low temperature cures with zinc oxide. These properties make Nitrex 2615 the most promising latex in the field of textiles, paper coating and saturation, nonwoven fabrics, adhesives, and tape release coating. Nitrex 2615 is 38-40% solids, has a pH of 7 to 9, has a viscosity of 10 to 30 (Brookfield units), and an average particle size of .08 microns.

Doubling Styrene Capacity

Forth Chemicals, Ltd., London, England, reports that good progress is being made in doubling the monomeric styrene capacity at their Grangemouth plant. The company states that due to the increased demand for this product a project for still further expansion has already been authorized and is proceeding. The entire expansion project is due to be in operation early in 1956. Forth Chemicals was formed in 1950 by British Petroleum Chemicals, Ltd., and Monsanto Chemicals, Ltd. British Petroleum Chemicals is jointly owned by British Petroleum Co., Ltd., and Distillers Co., Ltd.

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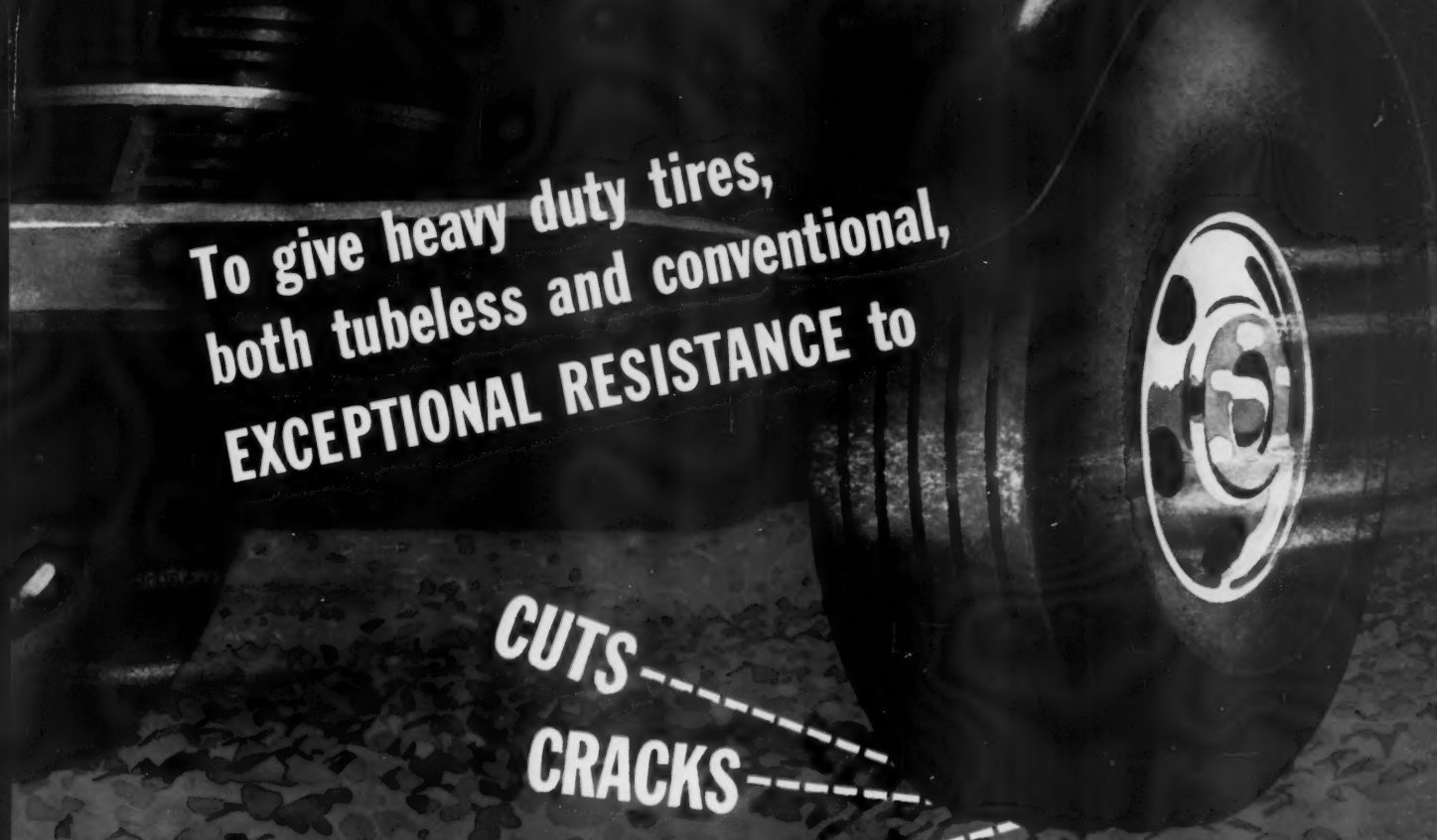

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NEWS IN BRIEF

A comprehensive chart, showing more than 120 organic syntheses based on orthonitrochlorobenzene, is available from Monsanto Chemical Co., Organic Chemicals Division, St. Louis 4, Mo.

Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4, Ind., recently published the second edition of the Reilly Chemical Index.

Rodney Hunt Machine Co., Orange, Mass., has released its Industrial Roll Engineering Report No. 5, entitled "Roll Shaft Fatigue Failure".

Carbide and Carbon Chemicals Co., New York, N. Y., has reduced the prices of its "Flexol Plasticizer A-26" by one cent per pound.

A technical, preliminary report on the use of Dresinol resin dispersions in emulsion paints is available from Hercules Powder Co., Wilmington, Del.

Witco Chemical Co., 260 Madison Ave., New York 16, N. Y., has issued a technical service bulletin entitled "Witcarbs in Polyvinyl Chloride Resins".

Milton Roy Co., 1300 East Mermaid Lane, Philadelphia, Penna., has issued a data sheet on "Solving Flow Control Problems in Continuous Polymerization of Rubber". Request Data Sheet A-54-4.

Claremont Pigment Dispersion Corp., 110 Wallabout St., Brooklyn, N. Y., has issued a technical bulletin on its "K" series of color pastes for vinyl plastisol compounding. Request Bulletin No. 140.

Rubarite, Inc., Magnet Cove., Ark., has appointed Borne, Scrymser Co., Elizabeth, N. J., as a distributor of "Rubarite", a synthetic rubber product for rubberized asphalt paving.

Baldwin-Lima-Hamilton Corp., Philadelphia, Penna., has effected a cross-licensing agreement with Carl Schenk, Darmstadt, Germany, involving fatigue testing equipment, SR-4 strain gages and gage devices.

A new publication, "Symposium on Color of Transparent, Translucent Products", is available from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna.

Market Forge Co., Everett, Mass., has issued a brochure describing the company's "Rental-Lease-Own" plan for materials handling equipment. Write for Bulletin No. 1107.

"Polygriptex", an adhesive suitable for bonding polyethylene coated kraft board, has been developed by Adhesives Products Corp., New York, N. Y.

B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio, has issued a Hycar Technical Newsletter on "Curing Systems for Hycar 1042."

Synvar Corp., Wilmington 99, Del., has issued a new technical bulletin entitled "Synvar Laminating Resins."

An improved contact adhesive, "Stix," for laminating Formica, Micarta, Consoweld, Panelyte, etc., to wood, without the use of any heat or pressure, has been developed by Adhesive Products Corp., New York, N. Y.

Easton Plastic Products Co., Inc., Easton, Penna., is manufacturing a low-cost, highly corrosion resistant pipe made from Geon.

Copies of a bulletin entitled "Allis-Chalmers Electronic Metal Detector" are available from Allis-Chalmers Manufacturing Co., 979 S. 70th St., Milwaukee, Wisc. Request Bulletin 15B7217B.

Advance Solvents & Chemical Corp., 245 Fifth Ave., New York 16, N. Y., has released data sheets on two Advance vinyl stabilizers, "Advastab T-72" and "Advastab BA-13P."

"Memo to Mars," a 24-minute, 16mm. black and white sound film dramatizing the need for better highways and parking facilities has been produced by U. S. Rubber.

The 1955 edition of the G-E Instrument Transformer Buyer's Guide is available from General-Electric, Schenectady 5, N. Y. Request publication GEC-1028.

"A Manual for Reinforced Plastics Tooling" has been published by the Marblette Corp., 37-21 30th St., Long Island City 1, N. Y. Available by request on company letterheads.

Godfrey L. Cabot, Inc., 77 Franklin St., Boston 10, Mass., has issued a chart listing the typical properties of Cabot Rubber Blacks.

Parade floats can be produced faster and at lower cost by spraying Bakelite vinyl resin-base skin over preshaped wire mesh attached to the float frame.

New York Rubber Corp., New York, N. Y., has been awarded a $143,868 military contract for 23,508 general purpose, pneumatic, nylon cloth mattresses under the Small Business Administration-Defense Department program.

Mona Industries, Inc., Paterson 4, N. J., has issued a revised folder on its line of Monamine surface active agents. Request Folder No. 220.

Smith-Gates Corp., Plainville, Conn., has developed a way of growing seedlings months before they could be sown out of doors by burying in the soil strips of Geon-coated electric wire connected to a thermostat.

Hatco Chemical Co., King George Post Road, Fords, N. J., has issued its 1955 brochure on Hatco plasticizers.

Goodrich recommends the use of tubeless tires to withstand the wear imposed upon tires by power steering, power shift, power brakes and higher power engines.

A booklet entitled "Opportunity for Industry: Trinidad and Tobago" is available from the Department of Industry and Commerce, Old Post Office Buildings, P. O. Box 284, Port-of-Spain, Trinidad, B. W. I.

Bakelite Co., New York, N. Y., has developed a strong, window-clear, flexible Krene cast film and sheeting, processed in continuous sheets and in thicknesses ranging from .005 to .010 inches.

Koroseal tank lining material, manufactured by Goodrich, is being used to protect the steel tank walls of the bumper-plating machine now in operation at the Pontiac Motor Division plant of General Motors.

"Texas V-2" is the title of a booklet issued by the Sid Richardson Carbon Co., Fort Worth, Texas, describing the company's new type of news ink black.

A new ice-slinger hose made of "Armorite" has been announced by Goodrich for loading crushed ice on trucks, refrigerator cars and ice compartments of ships.

"Danger Under Pressure" is the title of a new safety booklet being distributed by Hose Accessories Co., 2700 N. 17th St., Philadelphia 32, Penna. The booklet is intended for all hose users.

Goodrich has developed electrically heated rubber "boots" to prevent icing on helicopter rotor blades.

Contracts for tubeless tires for two of the Navy's newest jet fighters, the F9F-9 Tiger and the FJ-4 Fury, have been awarded to Goodyear.

Four executives of Lord Manufacturing Co., Erie, Penna., have taken to the air in order to provide better customer service. Lord maintains two planes—one in Erie and one in Dallas, Texas — to enable the pilot-executives to reach customers.

A technical bulletin on the "K" series of stir-in calibrated color pastes is available from Claremont Pigment Dispersion Corp., 110 Wallabout St., Brooklyn 11, N. Y. Request Technical Bulletin No. 140.

The Navy's airborne version of the LST, the Convair R3Y-2, utilizes an ingenious seal built inside a U-shaped solid rubber base, designed by Goodrich, to make the nose airtight for flying, take-off and landing.

FINANCIAL NEWS

B. F. Goodrich Co.

Quarter Ended March 31: Net income of $9,840,528, which is equal to $1.12 a share, compared with $8,556,458, or $1.02 a share, in the like period last year. Net sales for the first three months of 1955 amounted to $178,619,306, an increase of 17.5% over the $152,023,569 earned in the same period of 1954. Direct and indirect sales to the federal government were 6.8% of total net sales in the first quarter of 1955, compared with 10.1% in the 1954 quarter. Net sales and estimated net income for the first three months of 1955 include the new Sponge Products Division acquired in August, 1954.

Anaconda Wire & Cable Co.

For 1954: Net income of $4,700,215, which is equal to $5.57 a share, compared with $6,015,386, or $7.13 a share, in 1953. Net sales amounted to $108,683,307, compared with $131,476,146 in the previous year. Current assets as of December 31, 1954, totaled $34,490,039, compared with $42,203,282 as of December 31, 1953, while current liabilities as of the end of 1954 amounted to $17,874,451, compared with $21,752,851 as of the end of the previous year.

General Tire & Rubber Co.

Quarter Ended February 28: Net earnings of $2,236,310, which is equal to $1.62 a common share, compared with $1,851,515, or $1.46 a common share, in the like quarter of the preceding year. Net sales totaled $63,574,233, compared with $44,130,274 in the first quarter of the previous year. Net earnings in the 1955 quarter increased 20% and sales increased 42.9% over the 1954 quarter.

American Cyanamid Co.

Quarter Ended March 31: Net income of $9,453,616, which is equal to $1.02 a common share after preferred dividends, compared with $7,603,476, or 87c a common share after preferred dividends, in the same quarter of 1954. Net sales for the first three months of 1955 totaled $111,643,065, compared with $98,205,113 a year earlier. This report covers the company and subsidiaries.

Flintkote Company

Quarter Ended March 26: Net income of $600,127, which is equal to 41c a common share, compared with $646,110, or 45c a common share, in the same quarter of the preceding year. Net sales for the 1955 quarter amounted to $19,427,245, compared with $18,241,614 in the first quarter of 1954. This report covers the company and subsidiaries.

U. S. Rubber Co.

Quarter Ended March 31: Net income of over $9,940,276, which is equal to $1.63 a common share, compared with $7,545,109, or $1.18 a share, in the initial quarter last year. Net earnings in the 1955 quarter set a new first-quarter record, exceeding the previous peak profit of $9,076,755 set in the first quarter of 1951. Sales for the 1955 quarter amounted to $225,161,081, an increase of 18% over the $190,103,270 volume of the previous year and within 1% of the 1953 first-quarter sales record of $227,300,313.

Johns-Manville Corp.

Quarter Ended March 31: Consolidated income of $2,730,699, which is equal to 86c a common share, compared with $2,592,406, or 82c a common share, in the same quarter of the preceding year. Total sales volume for the first quarter of 1955 amounted to $56,269,622, compared with $51,913,065 in the first quarter of 1954. (This report covers the company and subsidiaries.)

Standard Products Co.

Nine months to March 31: Net profit of $1,518,004, which is equal to $4.15 a share, compared with $627,740, or $1.73 a share, in the same period of the preceding year. Net sales for the nine month period amounted to $22,996,265, compared with $21,825,760 in the same period of the previous year.

New Jersey Zinc Co.

For 1954: Consolidated net income of $3,092,657, which is equal to $1.58 a share, compared with $2,713,887, or $1.38 a share, in 1953. Sales in 1954, less costs, freight, discounts, returns and allowances, amounted to $14,704,391, compared with $12,085,803 in 1953. This report covers the company and subsidiaries.

Acushnet Process Co.

For 1954: Consolidated net income of $406,774, which is equal to $1.85 a common share, compared with $446,221, or $2.12 a common share, in the previous year. Net sales in 1954 amounted to $10,660,211, compared with $11,482,751 in 1953. (Figures for 1953 are for year ended December 31, 1953.)

National Automotive Fibres, Inc.

Quarter Ended March 31: Net income of $985,866, which is equal to $1.00 a share, compared with $376,264, or 38c a share, in the same quarter of the preceding year. Sales for the quarter amounted to $23,320,191, compared with $17,370,011 in the 1954 quarter.

Pittsburgh Coke & Chemical Co.

Quarter Ended March 31: Net income of $577,000, which is equal to 51c a common share, compared with $32,000, or 36c a common share (on combined preferred shares), in the same quarter of the preceding year. Net sales for the 1955 quarter amounted to $11,643,000, compared with $7,709,000 in the like quarter of 1954.

American Hard Rubber Co.

Twelve Weeks to March 27: Net income of $133,129, which is equal to 39c a common share, compared with $148,464, or 45c a common share in the same period of the previous year. Consolidated sales for the twelve weeks amounted to $4,519,686, compared with $4,210,034 in the same twelve weeks of 1954.

St. Joseph Lead Co.

Quarter Ended March 31: Net profit of $3,369,616, which is equal to $1.24 a share, compared with $1,099,377, or 40c a share, in the first quarter of 1954. Net sales for the 1955 quarter amounted to $31,723,474, compared with $17,841,481 in the like quarter of 1954.

Sheller Manufacturing Corp.

Quarter Ended March 31: Net profit of $880,488, which is equal to 92c a share, compared with $676,860, or 71c a share, in the same quarter of 1954. Sales for the 1955 quarter amounted to $13,854,475, compared with $9,458,000 in the like quarter of 1954.

Interchemical Corp.

Quarter Ended March 31: Net profit of $842,873, which is equal to $1.10 a common share, compared with $723,306, or 97c a common share in the same quarter of the previous year. This report covers the company and subsidiaries.

General Cable Corp.

Quarter Ended March 31: Net profit of $1,382,380, which, after preferred dividends, is equal to 60c a common share, compared with $1,280,663, or 58c a common share after preferred dividends, in the like quarter of the previous year.

Circle Wire & Cable Corp.

For 1954: Net income of $1,307,141, which is equal to $1.74 a common share, compared with $1,814,823, or $2.42 a common share, in 1953. Net sales for 1954 amounted to $16,586,276, compared with $22,145,892 in the preceding year.

McNeil Machine & Engineering Co.

For 1954: Net income of $2,829,148, which is equal to $5.14 a common share, compared with $1,668,435, or $3.03 a common share, in 1953. Net sales for 1954 amounted to $24,510,500, compared with $24,232,513 in the previous year.

Testing Rubberized Check Straps

Dayton Rubber Co., Dayton, Ohio, reports that large-scale field tests in more than 100 textile mills over the past year have shown that the company's rubberized check straps for looms effect substantial savings wherever they have been installed. The new check strap is said to be the first developed to supplant conventional leather. It is made of special synthetic rubbers and fabric and checks the force of the shuttle hitting the picker as it flies back and forth across the loom as many as 210 times per minute. The company states that leather is good for as little as two or three months, and seldom for more than 6,000 loom hours. The new strap is said to be far more durable, lasting a minimum of 9,000 to 10,000 loom hours. Some of the new straps have been operating as long as 14 to 16 months and are still going strong, according to company engineers. Dayton Rubber claims that its straps reduce costs on this item alone by some 25 to 50%. Other substantial savings are in labor, maintenance and less "down time."

UOP 88 Rubber Anti-Ozidant

Universal Oil Products Co., Des Plaines, Ill., has announced "UOP 88", a new additive that prevents cracking in rubber products. The company states that UOP 88 is employed specifically to retard ozone attack in rubber goods, and it has been found to be uniquely effective in preventing cracking in GR-S compositions, which are particularly susceptible to ozone cracking. The additive's use in other elastic, rubber-like substances is currently being evaluated. It has been found to be effective in preventing cracking even in dynamic uses where coating type anti-ozidants, such as waxes, fail, the company states. The product also has been proved effective in static uses or storage. UOP 88 is a heat-stable material, an important advantage for use in automobile tires or other rubber goods which may be subjected to relatively high temperatures.

Parker Appliance Co.

Nine Months to March 31: Net income of $820,310, which is equal to $2.12 a share, compared with $649,375, or $1.68 a share, in the same period of the preceding year. Net sales for the period amounted to $16,425,345, compared with $17,392,886 in the previous year.

Crown Cork & Seal Co.

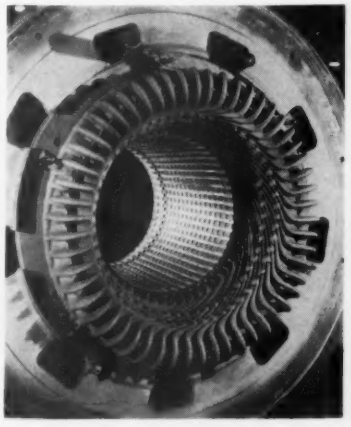
Quarter Ended March 31: Net income of $109,213, which is equal to 40c a share (on preferred stock), compared with $474,230, or 28c a share (on common stock), in the same quarter of the preceding year.

Okonite Co.

Quarter Ended March 31: Net profit of $251,398, which is equal to $1.40 a share, compared with $351,279, or $2.08 a share, in the same quarter of the previous year.

Silicone Rubber Motor Insulation

Allis-Chalmers Manufacturing Co., Milwaukee, Wisc., has announced what is said to be the first all-silicone rubber insulating system for large motors and generators. Known as the "Silco-Flex" system, it is immediately available for all Class H insulation form wound coils and for Class A and B windings operating under certain service conditions. Using as a base material Dow Corning's "Silastic" silicone rubber, the new insulation makes available the outstanding advantages known to be inherent in silicone base insulations. In the manufacture of Silco-Flex insulated stator coils, silicone rubber is applied to conductors, and vulcanized into a homogeneous mass by the application of carefully controlled heat and pressure. The result is a sealed, impervious electric barrier, continuous around the coil and leads, which forms a flexible, moisture and heat-resistant wall over the entire coil structure, the company states.



The new insulating system is said to offer advantages in heat, moisture and abrasion resistance, in flexibility and resilience, in chemical inertness and in improved heat dissipation. As a result of the availability of silicone rubber insulation, motor application practice is expected to change in a number of industries, Allis-Chalmers states. In power plant induced draft fan motors, for example, the highly abrasive cinder and fly ash contaminated atmosphere will have little effect on Silco-Flex insulated windings. Similarly, abrasive ducts on steel mill installations will not deteriorate motors protected with the new insulation. Some applications that formerly required totally enclosed frames may now be handled with semi-protected or open types. This same trend away from the extensive use of totally enclosed frames may be expected in many applications in the chemical, paper, food, and other industries where the moisture-impervious and corrosion-resisting qualities of Silco-Flex insulations can be exploited, the company states. The photograph herewith shows the stator for a 2500 hp, 2300-volt, 3580-rpm squirrel-cage induction motor wound with Silco-Flex all-silicone rubber insulation. This motor will operate under extreme moisture conditions, Allis-Chalmers states.

Goodrich Chemical Safety Award

Safety awards emblematic of over two and a half million man hours without a lost-time accident have been presented to the Louisville, Ky., plant of the B. F. Goodrich Chemical Co. J. R. Hoover, president of the company, presented the "President's Cup" to plant manager J. L. Nelson. The award is presented annually to the Goodrich Chemical plant compiling the most outstanding safety record for the preceding year. Four other awards were made to the plant by the Louisville Safety Council. A first place plaque was awarded in an interplant safety competition including all Louisville companies which employ between 500 and 1,000 people. Certificates of merit were presented for completing 1954 with no disabling plant injury and for having no fleet accidents with company vehicles during the year. The Council also tendered an award of honor to the plant for having passed the two and a half million man hour mark with an unblemished safety record. The plant employs over 900 persons.

Goodyear Plant for Venezuela

To meet growing consumer demands for its products, the Goodyear Tire & Rubber Co. will build a new, modern tire plant in Venezuela. The new South American plant will be the 39th production unit in Goodyear's world-wide manufacturing facilities, and the seventeenth foreign plant. It will be the seventh Goodyear factory in Latin America, others being located in Argentina, Brazil, Colombia, Cuba, Mexico and Peru. The new plant will be located near the town of Valencia, about 100 miles from the capital city of Caracas. Initial production will consist of a full range of passenger and truck tires and tubes, and finished products will be distributed throughout the country. At the outset, capacity will be about 500 tires a day. Sufficient land has been acquired for future expansion, officials said. Plans provide for a plant of single-story construction. The company expects to have the plant in operation before the end of 1955.

Dayton Rubber Co.

Five Months to March 31: Net income of $779,565, which is equal to $1.26 a common share, compared with $218,387, or 21c a common share, in the same period of the preceding year.

Allen Industries, Inc.

Quarter Ended March 31: Net income of $425,167, which is equal to 76c a share, compared with $332,327, or 59c a share, in the same quarter of 1954.

Belden Manufacturing Co.

For 1954: Net income of $1,085,361, which is equal to $3.39 a share, compared with $1,386,952, or $4.33 a share, in 1953.

National Rubber Machinery Co.

For 1954: Net income of $527,489, which is equal to $2.70 a share, compared with $665,742, or $3.40 a share, in 1953.

Goodrich Tubeless Airplane Tire

What is said to be the first high-pressure tubeless airplane tire capable of absorbing the severe shock of landings or take-offs at 300 miles per hour has been announced by the B. F. Goodrich Tire & Equipment Division. The new tire recently passed tests believed to be the most rugged ever given any tire, the company said. Although no larger than a passenger car tire, it withstood the almost unbelievable impact of a load of approximately 10,000 pounds at 300 miles per hour in a series of consecutive landings. One of the main features of the tire is a special tread capable of withstanding the extremely high temperatures and stresses developed by high speeds and heavy loads.

The dynamometer used to test the new tire is said to be the only one of its type in the world. It employs an electromagnetic clutch speed between the electric motor and the road wheel that controls the speed to any predetermined deceleration rate and loads can be controlled while the wheel is in operation. In the dynamometer landing tests, the new tubeless tire was rammed against the wheel, which was spinning at 300 miles an hour. The tire was held against the wheel for a length of time equivalent to the distance an aircraft would travel on a runway when making a landing.

The company states that the new tire saves up to 40% of tube weight. Basic construction principles of the tire are similar to those patented and used in Goodrich passenger car tires. A layer of special synthetic rubber inside the tire seals in the air, replacing the inner tube. Ridges molded on the outer sides of the tire bead prevent loss of air around the rim flange. Absence of the inner tube is said to permit closer control of tire balance and resultant minimizing of high speed spin-up vibration. Danger of a pinched tube is also eliminated, the company states. In addition, the layer of special synthetic rubber inside the tubeless tire enables it to retain air much longer than the conventional tube for airplane tires, Goodrich claims.

Three Advance Stabilizers

Advance Solvents & Chemical Corp., New York, N. Y., has introduced three stabilizers, "'Advastab" 50-LT, X-23-74 and X30-15. Advastab 50-LT is the new name for Advastab P-1935. It is a relatively non-toxic tin stabilizer for use in vinyl compounds. A viscous liquid, it has a viscosity of Z-10 at 25°C., and a specific gravity of 1.32-1.35 at 25°C. X-23-74 was previously known as X-BC-6738. X-23-74 is an experimental one-package liquid barium-cadmium stabilizer. It has been developed particularly for the copolymer grade resin, but it is effective in all straight PVC resins tested, the company states. A clear liquid, it has a viscosity of 150-200 cp at 25°C., and a specific gravity of 1.075 at 25°C. X30-15 is the new name for XZ-15. This is an experimental organic zinc compound developed for low cost non-sulfur staining applications. A liquid, it has a viscosity of 400-500 cp at 25°C., and a specific gravity of 1.100 at 25°C.

Announces Management Course

The College of Engineering, State University of Iowa, has announced the sixteenth Management Course to be held June 13 through June 25, 1955 in Iowa City. Since its inception over 1000 representatives of American and foreign business, industrial, and governmental organizations have increased their understanding of the design and application of the major management techniques. To the intensive course of instruction is added a series of talks by recognized authorities on new developments, applications, and problems in management techniques. The entire program is designed for those who have need to use these techniques—factory managers, foremen, industrial engineers, methods and time-study analysts, cost men, office executives, and others in related work.

The areas of Production Planning, Job Evaluation, Motion and Time Study, Wage Incentives, Plant Layout, Materials Handling, Quality Control, Supervisory Training, Labor Relations and Legislation, Organization and Policy, and Public Speaking are included. The regular State University of Iowa teaching staff will be augmented by outstanding men from a variety of industries and other educational institutions. Communications concerning the course should be sent to J. Wayne Deegan, 124 Engineering Building, State University of Iowa, Iowa City, Iowa.

Toyad Expanded Polystyrene

Toyad Corp., Latrobe, Penna., has announced the production of "Chemfoam KR," an expanded polystyrene. Slabs, 36 inches by 120 inches, are being produced in thicknesses of ½-inch to 2 inches. Densities from 1.8 to 10 pounds per cubic foot are available. Chemfoam KR is particularly outstanding in thermal insulation efficiency and light weight, the firm states. It is readily adaptable for buoyant applications as a result of its unicellular structure and excellent water resistance. This product can also be molded to shape. Molded Chemfoam KR as well as slab will offer considerable assistance in difficult packaging applications. It is also adaptable for construction of light weight displays, Toyad claims.

LABOR NOTES

A strike by 150 machinists at the Manhattan Rubber Division of Raybestos-Manhattan, Inc., was settled on April 19. The strike, in its third week, had interrupted production at the plant as 2,000 other employees refused to cross the picket line. The striking union—Manhattan Lodge, International Association of Machinists, A. F. L.—voted to accept a company offer of a 3c hourly wage increase and a seventh paid holiday. The union said the company had agreed not to farm out machinist work to subcontractors unless the concern's own machinists were working a forty-hour week. The bulk of the plant's employees belong to an independent union of rubber workers, which instructed its members to make up their own minds about crossing the picket line.

Colored Sidewall Tires

What is said to be the first successful production of tires in a variety of colors —a goal sought by the rubber industry for 40 years—has been announced by the U. S. Rubber Co., New York, N. Y. U. S. Rubber is adding three colors—blue, green and brown—to its line of white sidewall "Royal Master" tires. The color extends from the outer edge of the white sidewall to the top edge of the tread. The tread itself is still black to maintain its wearing quality. The color accents the white sidewall and blends with the two-tone color styling of 1955 automobiles. Production of colored tires has started at the company's Detroit tire plant, and the tires will be available to the nation's motorists starting in April. U. S. Rubber said it has been able to use color successfully because of improved methods of rubber compounding, pigmentation and the use of new chemicals which are non-staining and non-discoloring.

The colored portion of the tire is especially compounded and bonded to the sidewall and becomes an integral part of the tire once it is cured. It cannot rub off and it actually improves the tire's scuff resistance. Neither the blue, green nor brown show dirt as readily as black. Much of the credit for the development of colored tires, U. S. Rubber said, must go to a woman tire designer in the company's Detroit plant who experimented with more than 30 different hues before selecting the present production models. The first auto tires produced in this country in 1894, U. S. Rubber said, were white because zinc oxide was the only reinforcing agent used by the rubber industry at that time. Carbon black, with its tremendous advantages for increased mileage and toughness, transformed white to black in 1915. Tires have been black ever since; that is, until now —the first successful departure from black in the ensuing 40 years.

Chemical Resistant Plastisol

A new chemical resistant plastisol has been developed by the Watson-Standard Co., Pittsburgh, Penna. This compound, called "16-093," is supplied as a free flowing liquid and is converted by heat into a flexible, rubberlike coating for application to metal parts. The coating may vary from 1/32-inch to ½-inch, and is a smooth, dense, tough, abrasion resistant and resilient film. 16-093 is primarily formulated for dipping application using either the cold dip or the hot dip technique. However, it may be modified on request for spraying or roller coating methods. This compound is ideal for racks, tote baskets, tank linings, valve parts, shelving and other metallic surfaces where chemical resistance is a prime requisite, the company states. Watson-Standard's 16-093 has excellent chemical resistance to oils, greases, acids, alkalies, salts of organic acids and petroleum solvents. Black in color (other colors supplied on request), it is shipped at 100% solids and when properly cured has a tensile strength of 1800 p.s.i., a durometer of 60-65 Shore "A," and a specific gravity of 1.20 to 1.25.

Predicts 1955 Tire Shipments

Tire shipments in the United States will this year total, or exceed, 99,000,000 units, W. S. Richardson, president, the B. F. Goodrich Co., told the Boston, Mass., Analysts' Society at a meeting there recently. Foreseeing a continuing increase in the production and use of motor vehicles, the rubber company executive estimates that passenger car registration will increase from 48,000,000 today to 57,000,000 in 1960. "It is our conclusion that by 1960 consumption of new rubber in this country will exceed 1,500,000 long tons, and we think this is a conservative estimate," Mr. Richardson said. "This would be an increase in consumption in excess of 20% between now and 1960, not only for tires, but generally across the board for use in rubber products of all kinds. Consumption of new rubber this year will approximate 1,290,000 long tons, an increase of about 57,000 long tons over 1954. The nation's all-time peak use of rubber, man-made and crude, was 1,338,000 long tons in 1953, more than double the tonnage consumed in 1940." Mr. Richardson revealed that Goodrich plans to spend more than $25,000,000 in 1955 for expansion and improvement. He said also that the company's previous estimate that it will spend $100,000,000 in the next five years is a conservative one—that the figure probably will be exceeded.

Expands Plasticizer Production

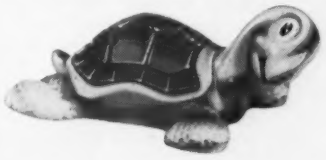
Because of increased demand for low-temperature plasticizers, the Trenton, N. J., plant of the Thiokol Chemical Corp. has recently completed expansion of its capacity for the production of "Plasticizers TP-90B and TP-95." With the new equipment, capacity has been more than doubled and it is expected that no delay will ensue in the processing of orders for these materials. Plasticizers TP-90B and TP-95 are used for low-temperature plasticization of GR-S, neoprene, acrylonitrile-type rubbers, natural rubber, and vinyl resins. These plasticizers maintain high resilience over a wide temperature range, are compatible with the elastomers, and do not appreciably impair their physical properties even at high concentrations, the company states. Thiokol TP-90B and TP-95 are used in low-temperature fuel hose, cellular sponge rubber products, sheet-rubber packing, dipped goods, proofed goods, and for a variety of extruded and aircraft molded parts.

9th Chemical Exposition Planned

The Chicago Section of the American Chemical Society has announced that the 9th National Chemical Exposition will be held in the Public Auditorium in Cleveland, Ohio, on November 27-30, 1956. The 1956 show will be held under the joint auspices of the Chicago and Cleveland Sections of A.C.S. In connection with the Exposition, the Cleveland section will hold one of its meetings-in-miniature. Floor plans, special features, and other details of the 9th National Chemical Exposition will be announced at a future date.

Vinyl Float-Squeeze Toys

Plastics Division of the National Latex Products Co., Ashland, Ohio, is manufacturing a new line of four vinyl float and squeeze toys: Gilly the Fish, Sammy the Whale, Tillie the Turtle (shown herewith) and Wally the Walrus. Each toy has a wide-awake expression and features a



whistle voice for "talking" or "blowing bubbles" in the bathtub. All are spray-decorated with long lasting, non-toxic colors specially developed by the company. The toys are packaged in window boxes with appropriate inside and outside decoration.

New Firestone Racing Tires

Two completely new series of tires developed by the Firestone Tire & Rubber Co., will be featured in the 39th running of the famed 500-mile Memorial Day racing classic at Indianapolis, Ind., this year. The new tires have been designed to provide increased safety, better balance, longer wear and improved handling. Both front and rear tires have been redesigned and engineered with a slightly narrower tread for improved handling, and with a thicker tread for increased wear. Like the outer dimensions, both the tread and body components have been improved in the 1955 tires. The tread compound was determined only after thousands of test miles had been driven at average speeds ranging from 138.88 mph to 144.12 mph. The narrower tread width of the tires plus the cooler running characteristics of the stronger nylon body and improved tread compound will give increased wear, the company states. The tires have a six-ply nylon cord body. The ribs of the tires are engineered to provide quick visual tread depth of tires in use during the race.

Davis-Standard Licenses Finney

Davis-Standard Sales Corp., Mystic, Conn., has announced that a license to manufacture and market their electrical wire insulating machinery in Europe and the Sterling Area has been granted to Finney Presses, Ltd., Birmingham, Eng. Finney Presses has been representing Davis-Standard as a sales agent for some time, and will continue in this capacity until the completion of the tooling that will enable them to begin production.

U. S. Rubber has published an educational, 43-page Braille booklet about rubber. Organizations for the blind may obtain free copies from the Public Relations Department, U. S. Rubber Co., 1230 Ave. of the Americas, New York 20, N. Y.

Electron Inventory Unit

The Teleregister Corp., of New York, N. Y., has announced plans to install what is said to be the first electronic inventory control system in the rubber industry at the Watertown, Mass., footwear and flooring plant of the B. F. Goodrich Co. Contracts have been signed with Teleregister to install and maintain a Magnetronic Inventory System similar, in operating principles, to the Magnetronic Reservisors already in use in the air transport industry for expeditious handling of passenger reservations. Heart of the Teleregister system is a magnetic storage drum which holds, and makes available for instantaneous visual and printed reference, many thousands of style size items of information on the rubber company's complex inventory picture. It will also record the quantities of each style and size committed for future shipment. The system will produce on demand a tabular description of the numerical difference between quantities on hand and "committed orders" for any or all styles stocked by the company. It will also generate permanent records of individual transactions, useful for preparing punched card summaries for accounting or forecasting procedures.

DuPont Grants Nylon 8 License

The first license to produce and market commercially "Nylon 8", a new plastic with greatly increased life-prolonging qualities for industrial and consumer products, has been granted by E. I. du Pont de Nemours & Co., Inc., to Belding Corticelli Industries, Inc., newly-established subsidiary of Belding Heminway Co., Inc., New York, N. Y. Designated as Nylon 8 by DuPont, it is to be known as "BCI Nylon" as produced in commercial volume for the first time by Belding Corticelli Industries. Unlike original nylon, BCI Nylon can be processed in liquid form, as well as by the standard methods used for all plastics. Nylon 8's chief characteristics include high strength and toughness which resist tearing and abrasion. It will not break from flexing because of high elasticity, is an exceptional adhesive for wood, metal, glass and paper, will bind pigments to textiles simultaneously with printing, may be used as a fiber binder in the manufacture of non-woven fabrics of rayon, nylon and cotton, and is a hydrocarbon barrier for rubber fuel tanks, gasoline lines, gaskets and seals because of its resistance to aromatic aliphatic hydrocarbons.

Elected Nopco President

Ralph Wechsler, associated with the Nopco Chemical Co., Harrison, N. J., since 1921, has been elected president of the company succeeding Thomas A. Printon. Mr. Printon, president since 1949, continues as chairman of the board. Mr. Wechsler joined the company in 1921 as a chemist and was elected a director in 1927. He became treasurer of the company in 1932. Mr. Wechsler will also act as chief officer of the Metasap Chemical Co., a wholly-owned subsidiary.

New Phillips Plants Planned

Phillips Petroleum Co., Bartlesville, Okla., has announced that its wholly-owned subsidiary, the Phillips Chemical Co. of Akron, Ohio, has begun construction of a large plant to produce "Marlex," its superior new polyethylene. The plant will be located on the Houston Ship Channel near Pasadena, Texas. Phillips Chemical will also construct a 145,000,000 pound per year ethylene plant to be located at Phillips Petroleum's refinery near Sweeny, Texas. These two plants and the pipeline between them will represent a multi-million dollar investment. The first unit of the Marlex plant will be rushed to completion to supply the heavy demand for this material. Additional Marlex production lines will be completed at intervals of several months thereafter. Marlex is to be made by the low pressure catalytic process developed by Phillips and announced about a year ago. This process is said to produce polyethylene that is stronger, tougher and in some varieties more rigid than conventional polyethylene. It has much better resistance to chemicals and penetration by moisture, gases and solvents. It does not become brittle in temperatures as low as 175°F. below zero. Marlex does not soften or deform at steam sterilization temperatures as high as 250°F., the company states. Phillips officials said that the demand for Marlex appears to be so great that the process will be licensed to others in the near future.

Paisley Buys Scriptex Adhesive

Paisley Products, Inc., a division of Morningstar, Nicol, Inc., New York, N. Y., has purchased the inventory of the Scriptex Adhesive Products Co. of Philadelphia, Penna., and has transferred the manufacturing operations to their plant in New York City. The product line includes vegetable base pastes and glues, latex and polyvinyl resin cements and other industrial adhesives sold to paper converters, package manufacturers, distillers, canners, printers, binders, and woodworking firms. Al Cohen, former partner and manager of Scriptex, has joined the Paisley sales organization as a special sales and service representative in the Philadelphia territory. The Paisley Philadelphia office, under regional manager, A. R. Nordone, is located in the Harrison Building at 15th and Market.

Receives African Assignment

M. E. Rittenhouse, formerly assistant manager of the Interplant Division of the General Tire & Rubber Co., Akron, Ohio, has been appointed manager of the company's plant in South Africa. George Popa, who has been factory manager of the plant for the past three years, will return to Akron to receive a new assignment. Mr. Rittenhouse originally opened the plant as factory manager in 1948. In 1952, he returned to Akron as assistant manager of the Interplant Division.

Grant Enters Styrene Market

Foster Grant Co., Leominster, Mass., said to be the only fully-integrated company in the plastics industry, has announced plans to produce and sell styrene. About one year ago the company entered into the production of styrene for its own use to make it a fully-integrated plastics producer. The company now states that it will double the capacity of its plant near Baton Rouge, La., to provide styrene for commercial sale. The firm has already shipped its first tank car of styrene to the Copolymer Rubber and Chemical Co. at Baton Rouge. Joseph C. Foster, president of Foster Grant, stated that the expansion being undertaken at the Baton Rouge plant will provide a capacity of more than 50,000,000 pounds of styrene annually, compared with present capacity of 24,000,000 pounds annually. The Foster Grant styrene plant employs processes first developed in Germany and unique to this country. The company states that application of the new techniques made it possible to construct the styrene plant at a cost far less than had been thought feasible prior to that time.

Sets New Safety Record

The Naugatuck, Conn., footwear plant of U. S. Rubber Co. has broken the world's record for safety in the rubber industry. The 5,500 employees set a new mark by working 7,801,624 man-hours without a lost-time accident. This record is continuing, the company states. The new mark set by Naugatuck betters the previous world's record in the rubber industry, established in 1953 by the Memphis tire plant of the Firestone Tire and Rubber Co., with 7,721,421 man-hours worked without a lost-time accident. "The new world's record is the result of daily teamwork between management and employees in the Naugatuck footwear plant," said Wesley M. Graff, director of safety for U. S. Rubber. "Accident-free records such as this can only be made when management gives real leadership to the safety program and employees cooperate every day."

"Do something about that cold — that sneeze just cost the company six dollars!"

Reopens Moss Point Plant

Because of increased demand for polysulfide liquid polymers, the Moss Point, Miss., plant of the Thiokol Chemical Corp., Trenton, N. J., has been reopened after a temporary shutdown. The Moss Point plant is presently running on an increased schedule on the manufacture of polysulfide liquid polymers. These materials are oil and solvent resistant elastomers with a large number of industrial and military uses. This increase in activity brings the operation at Moss Point to its highest level since the original opening in July, 1952. The plant is designed to produce large quantities of polysulfide polymers, starting with the basic chemical ingredients, which include ethylene oxide, sulfur and caustic soda. During the shutdown, production of the monomer for polysulfide polymers was continued in order to supply raw materials to the Trenton division of the company. With the reopening, the polymerization units were reactivated, and polysulfide polymers are being produced at Moss Point as well as at Trenton. The polysulfide liquid polymers are widely used as sealants for integral fuel cells in aircraft, as sealer-adhesives for machine components, for potting and sealing electrical parts, and for caulking ship decks. They are also used as flexibilizing constituents of epoxy-based adhesives, compounds and laminates.

Installs Tire Cord Unit

Installation and start of operation of a $2,000,000 nylon tire cord processing machine at its Oaks, Penna., plant has been announced by the B. F. Goodrich Co. Tire and Equipment Division. Arthur Kelly, president of the division, said the new unit, a specially designed "calender train," occupies an area longer than a football field and 60 feet wide. He said the unit enables the plant to boost its tire production by 20%. The machine was designed by Goodrich engineers as a new vehicle for the company's weftless creel process, in which nylon tire cords are coated with adhesive and rubber at a prescribed uniform tension. Mr. Kelly said this process, which the company has used for seven years, results in cooler-running tires that provide maximum safety at high speeds. Cords processed in the new unit are used in truck, bus, off-the-road, airplane and passenger car tires, including an all-nylon tubeless tire. The cord is also used in the company's exclusive "shock-shield," an extra layer of rubber-covered nylon cords placed between the tread and plies of all the firm's heavy-duty truck tires to protect against tire bruises and breaks.

Financial Arrangements Approved

An offer by the Amertex Manufacturing Corp., E-Z Thread Co., Gerry Nufoam Products Corp., and the Gerry Nufoam Shoe Corp., all of 385 Gerard Avenue, New York, N. Y., to settle outstanding debts for 25% has been accepted by creditors. The arrangement was confirmed on April 25 by the Southern District of the U. S. Court.

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Enjay now foremost butyl rubber supplier

90,000 tons yearly production of Enjay Butyl, now available from its originators, will go into varied industrial products

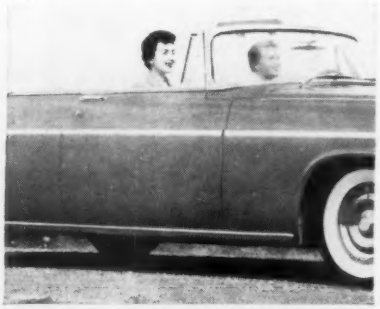
Enjay Company, Inc., a pioneer and leading supplier of petroleum chemicals, will market Butyl and supply advisory service in its applications.

The low price and high-level performance of Enjay Butyl allow it to replace natural and other rubbers now used in industry. Enjay Butyl is the rubber that combines high resistance to aging . . . abrasion . . . tear . . . chipping or cracking . . . ozone or corona . . . chemicals and gases . . . heat . . . cold . . . sunlight . . . and moisture.

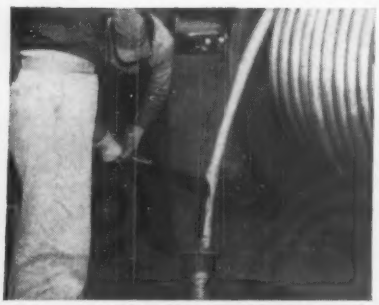
The new Enjay Laboratories, located at Linden, New Jersey, are equipped to provide expert technical assistance in compounding and adapting Enjay Butyl to individual uses and requirements.

Distinctive properties and low price give Enjay Butyl wide industrial application

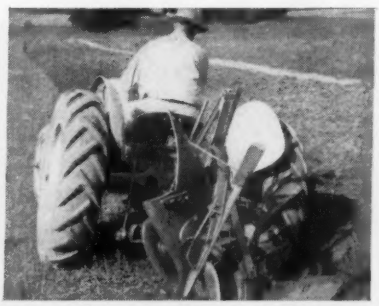
Inner tubes are made of BUTYL because BUTYL holds air ten times better than natural rubber. Its impermeability to gases promises many uses.



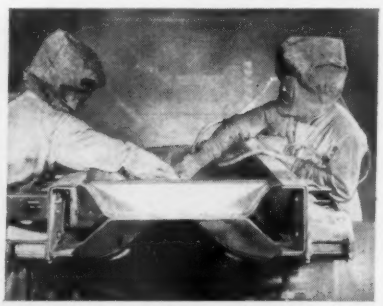
1955 cars use Butyl for dozens of rubber parts, because BUTYL has super-durable resistance to aging or deterioration on exposure to heat, cold, sun, weather, and chemicals.



High voltage electrical cables are made with BUTYL because BUTYL offers superior corona and ozone resistance, combined with excellent heat, cold, and abrasion resistance.



Tractor tires are made with BUTYL because BUTYL gives low tread wear and high resistance to weather, cracking, cutting, and chipping.



Protective clothing, tank linings, belt covers, hoses, and other equipment in contact with chemicals use BUTYL because of its exceptional resistance to chemicals.

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LOS ANGELES NEWS

The April 6th meeting of the Los Angeles Rubber and Plastics Group held in the Statler Hotel, Los Angeles, Calif., attracted about 260 members and guests. The meeting was sponsored by the W. J. Voit Rubber Corp. The technical portion of the meeting was addressed by James N. Cooke, Jr., vice-president of the Cooke Color & Chemical Co., Glen Rock, N. J. The non-technical portion of the meeting featured an address by Arthur Lonergan, art director of MGM studios. Mr. Lonergan described some of the methods employed in designing and preparing sets for the production of motion pictures.

In his talk, Mr. Cooke stated that most organic colors used in the rubber industry are lakes of metal salts, and the possibility of copper or manganese contamination is very definite. Inactive manganese is allowable up to 300 parts per million, but active or soluble manganese is deadly to any rubber compound in percentages exceeding 10 parts per million. Active copper is allowable up to 25 parts per million, the speaker stated. An excess of either of these metals in masterbatch or in a finished compound will cause its rapid deterioration.

Mr. Cooke observed that a rubber color should be compatible to all commonly used polymers. A color that is good in crude rubber, he said, is also good in the various synthetics. With both organic and inorganic colors there are two ways of incorporating these materials—as either dry pigments or masterbatches.

Masterbatching usually adds about 10% to color costs, but this slight additional cost is small compared to the indirect savings effected. Colors, either dry or masterbatch, should be incorporated during the rubber breakdown whenever possible, Mr. Cooke declared.

The speaker then discussed the problems inherent in color blending. In blending colors, one should keep in mind a color spectrum remembering the inter-relation of one color to another. Mr. Cooke also discussed the question of permanency of colors and touched upon such factors as non-migrating, non-bleeding and non-cracking characteristics.

Mr. Cooke noted that the industry is still trying to find some really perfect pigments for use in rubber. The closest we have are the phthalocyanine shades green and blue. Some day, a red and yellow of similar merit will be found.

The May 3rd meeting of the Los Angeles Rubber Group, scheduled to have been held at the Statler Hotel in Los Angeles, Calif., was to have been sponsored by the Goodyear & Tire Co. The meeting was to have featured a program of entertainment. Plans have been announced by the group for the annual summer outing. The outing will take place on June 4 and 5 at the Coronado Hotel in San Diego, Calif. Fishing parties and golf tournaments will be held on June 2 and 3.

Lloyd Reich, formerly manager of the Triangle Tool Co., has been appointed head of engineering and development for the R. L. Mitchell Rubber Co., Los Angeles, Calif.

Large-Size Polyethylene Bags

Crystal-X Corp., Lenni Mills, Penna., has installed the "Magni-Velope Automatic", designed and specially built for the manufacture of large polyethylene bags, liners for barrels, boxes, cartons, cases and drums, and for special protectors. This new machine mass produces the item required, uniformly sized, up to 40 inches wide by 70 inches long. Resulting production economies are directly reflected in lower prices for medium and large sizes that previously have been very costly due to slow production methods, the company states.

Arogen GPF Oil Furnace Black

"Arogen GPF," a new low-cost general purpose oil furnace black, is now available in commercial quantities from J. M. Huber Corp., New York, N. Y. This new black is an all-around utility black, equally good for tires and mechanical goods, the company states. Arogen GPF has high tensile and high tear properties and excellent processing characteristics. Its reinforcing properties are superior to SRF grades.

12th SPE Conference Planned

The Twelfth Annual Conference of the Society of Plastics Engineers will be held at the Statler Hotel in Cleveland, Ohio, from January 17 through 20, 1956. Registration will begin on January 17 with talks starting on January 18 and extending through January 20. The annual business meeting and luncheon wil be held on January 18 and a banquet is scheduled for the evening of January 19. Further information may be obtained from S. A. McElroy, Hercules Powder Co., 865 Union Commerce Building, Cleveland, Ohio.

Nopco Promotes Collins

Benjamin S. Collins has been named by the Nopco Chemical Co., Harrision, N. J., as chief development engineer of its Plastics Division. He will be in charge of the development program for "Lockfoam," Nopco's foamed-in-place plastic. Associated with Nopco since 1953, Mr. Collins previously served as a sales development engineer for Lockfoam in the Eastern states.

DuPont Technical Publications

In recent months, the Elastomers Division of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del., has published a number of technical reports of interest to the rubber industry. The titles of the reports follow:

BL-249 — "Practical Neoprene Compounds for Use in Highly Competitive Products".

BL-250—"The Prevention of 'Strike-Through' in Neoprene Latex Coated Fabric".

BL-276 — "Age-Resistant Hot Water Bottle Compounds."

BL-277—"Neoprene Milking Inflations".

BL-278—Zenite Special: Low Cost Protection for GR-S Latex Films".

BL-279—"Non-Black Neoprene Footwear".

BL-280—"Sulfurless Natural Rubber Latex Cures".

BL-281—"Acceleration of the W Types of Neoprene".

BL-282—"Thionex-MBTS Acceleration of GR-S Camelback".

BL-283 — "Neoprene Tubeless Tire Valves".

Report No. 54-1—"Neoprene Latex Type 736".

Report No. 55-1—"Aquarex L: An Outstanding Corrosion Inhibiting Mold Lubricant".

Report No. 55-2—"Thiuram M: A. Fast Curing Accelerator and Vulcanizing Agent".

Report No. 55-3—"The General Story of Hypalon Chemical Rubber".

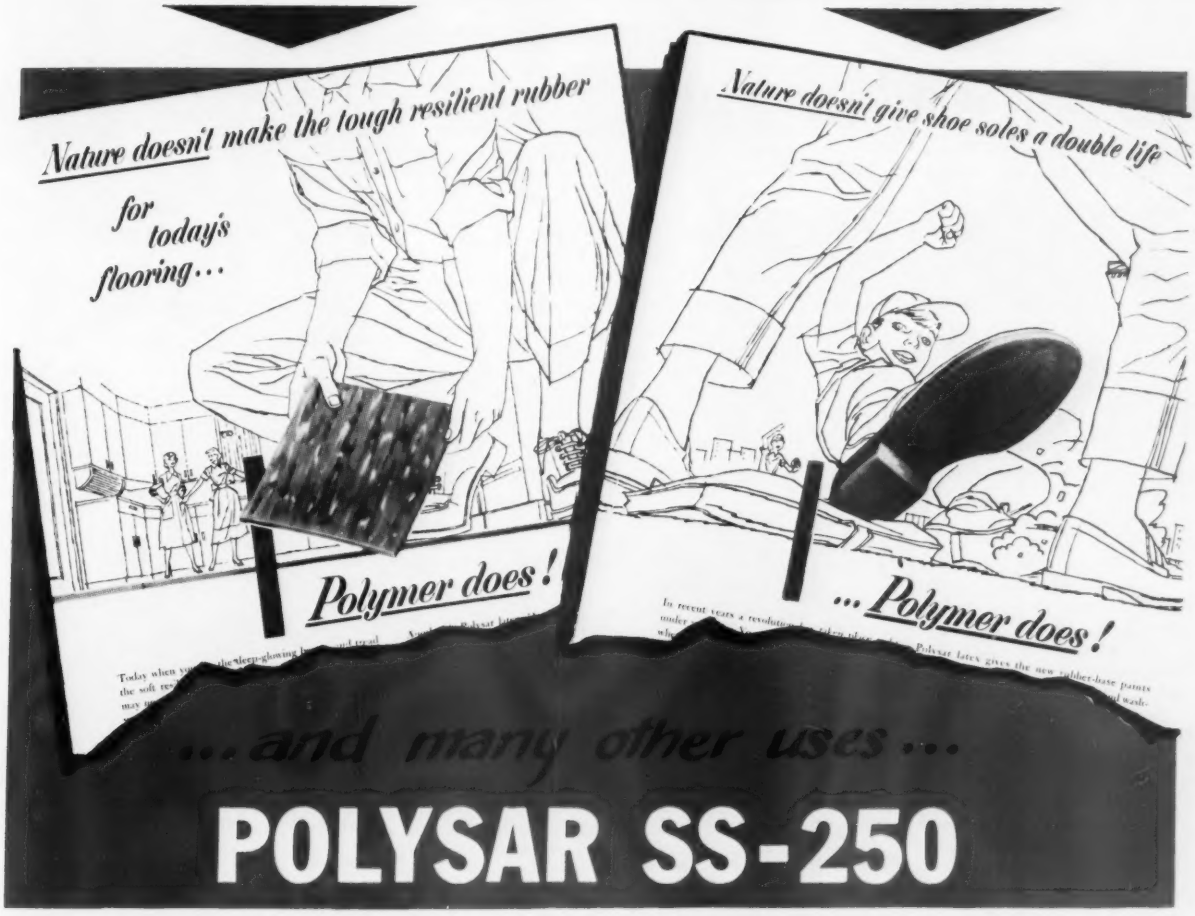
Forms Special Products Group

W. C. Landis, vice-president and general manager of the Air Brake Division, Westinghouse Air Brake Co., at Wilmerding, Penna., has announced formation of a new Special Products Group to expand that division's manufacturing and marketing activities. DeWitt L. Shelly has been appointed manager of this Special Products Group which will specialize on quality controlled manufacture, assembly and test of general industrial apparatus and components, including pressure tanks, precision gears, electronic chassis, molded rubber and plastics and gray iron, brass and aluminum castings. Facilities and capacities at the division plant in Wilmerding will be utilized and supplemented as required.

Joins National Polychemicals

National Polychemicals, Inc., Wilmington, Mass., has appointed Henry R. Lasman to its technical staff. Mr. Lasman will be in charge of the new rubber and plastics laboratory just completed at the firm's Wilmington plant site. Mr. Lasman is a graduate of the State Technical College, Zurich, Switzerland, and was formerly associated with Acton Rubber, Ltd., Canada. Prior to that he had been associated with Pharmed Company, Ltd., Canada; Oerlikon Tool Machine Works, Switzerland; Societe Industrielle de Caoutchouc S. A., Switzerland; H. Schneider A. G., Poland; and Experimental Agricultural Station, Poland.

FOR FLOOR TILE . . . SHOE SOLING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CANADIAN NEWS

Elimination of the 10% excise tax on tires and tubes has been acclaimed as a boon to the customer and a boost for the rubber industry in Canada. The cut, effective immediately, means a saving of about $1.50 on an average tire and 25c on a tube. James P. Anderson, general manager of the Dunlop Canada, Ltd., Toronto, said removal of the tax is likely to stimulate employment in the Canadian tire industry. "We are gratified the government has finally removed the tax from a commodity in everyday use by Canadians and therefore hardly a luxury."

R. C. Berkinshaw, president of the Goodyear Tire & Rubber Co. of Canada, said he is "very pleased" by the tax cut. "It means the government has at last acknowledged that a luxury tax on an article heavily used by the public was illogical in the first place. The repeal of the tax should have a stimulating effect on sales because it will mean an adjustment in prices." He said it would be up to individual dealers to pass along the reductions to customers.

The tax cut is effective on all tires and tubes—including those for trucks, buses and aircraft, as well as automobiles. "In these latter cases the special tax applies to items which enter into the cost of carrying on certain kinds of business," Finance Minister Harris stated in his budget address. "I have decided to repeal completely the excise tax on all tires and tubes regardless of their use. The revenue loss will be $8,500,000 in a full year and $8,000,000 in this fiscal year." The excise tax was only applicable on replacement tires and not on original equipment.

Elimination of the tax on tires and tubes will give the Canadian rubber industry a better chance to compete with U. S. products, said Ira G. Needles, president of the B. F. Goodrich Co. of Canada. "I am glad to see the government no longer considers tires a luxury," he said. "Surveys indicate 86% of all automobile tire mileage is for business."

A contract for removal of remaining operating equipment from the closed plant of Canadian Industries (1954) Ltd., has been awarded to A. A. Klein and Sons, of Montreal and Shawinigan Falls, P. Q. The arrangement under which A. A. Klein and Sons will be directly responsible for removal and disposal of equipment is designed to make the entire property available for immediate occupancy by a potential purchaser. Several buildings are already vacant and others will be cleared shortly. Building services and accessories including railroad sidings will remain. The contract may be extended to include demolition of certain buildings which were designed for specific purposes and have limited value for general use. It is expected that the project, estimated to require four to six months for completion, will substantially improve the appearance of the property and make its potentialities more readily evident.

Canadian Chemical Co., Ltd., has announced plans to produce five more industrial chemicals at its plant in Edmonton, Alberta. Additional equipment installation has been approved, and construction is now in progress. Operations are scheduled to begin by midsummer. The new products to be made at the plant include methyl isobutyl ketone, butylene glycols, methyl ethyl ketone, methyl isobutyl carbonol and glycol ethers, which are widely used but are not produced in Canada at the present time.

At the recent annual meeting of the Rubber Association of Canada in Toronto, Ont., R. C. Berkinshaw (Goodyear), retiring president, stated that it is not fully appreciated that suggested retail prices of Canadian tires, which include sales taxes, are often within a few cents of the prices of equivalent tires in the United States, when federal taxes are added. Mr. Berkinshaw stated that in some cases, "in the more popular sizes where we enjoy relatively good volume in production, there are examples of Canadian tire prices which are actually lower than the equivalent prices in the United States."

G. B. Smith, general manager of the Rubber Association of Canada, told the meeting that Canadian consumption of rubber dropped slightly in 1954 from the peak reached in 1953. Mr. Smith said that 1954 Canadian consumption at 71,645 tons, was 1,750 tons less than in 1953, but was still the second highest on record.

The drop in consumption was centered on synthetic rubber, he reported. Consumption of natural rubber, including latex, rose from 37,482 tons in 1953 to 41,574 tons in 1954. Consumption of synthetic rubber dropped from 35,910 tons in 1953 to 30,071 tons last year.

Mr. Smith pointed out that the rubber industry finds outlets for its products in practically every sphere of economic activity, and, as a result, shared in the "slight recession" experienced by the economy as a whole during 1954.

Other factors affecting the rubber situation in Canada were: A substantial rise in natural rubber prices during the second half of the year; a marked decrease in production in the automotive and agricultural implement industries, and a further large increase in imports of rubber-soled canvas footwear.

However, Mr. Smith found the outlook for 1955 was for an increase in rubber consumption in Canada. "As total rubber consumption is largely determined by the level of production in the tire industry, and as the tire industry has good reason to anticipate that 1955 sales will, on the whole, be appreciably higher than 1954 sales, it may be assumed that total new rubber consumption in 1955 will rise considerably above the 1954 level. . . ."

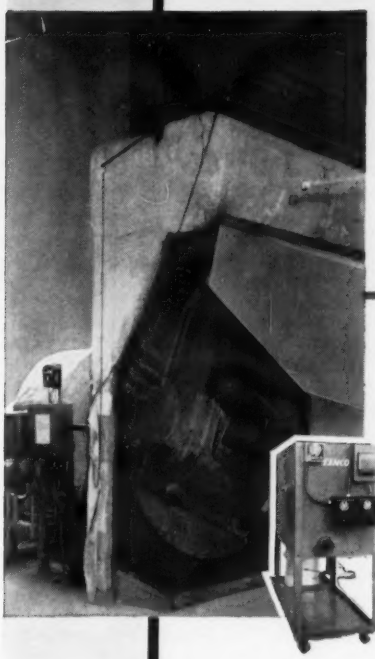
Mr. Smith said that reduction in the excise tax on cars from 15% to 10% should provide a good basis for a marked rise in equipment sales of passenger tires. "Likewise," he added, "the widespread publicity given to tubeless tires by their appearance on new model cars coupled with the removel of the 10% excise tax on tires, should have a decidedly tonic affect on passenger tire replacement sales."

W. H. Funston, president of the Firestone Tire & Rubber Co. of Canada, Ltd., was elected president of the association. Other officers elected by the board of directors are: Vice-president, I. G. Needles, president of B. F. Goodrich Canada Ltd.; treasurer, J. R. Belton, vice-president and general manager of Gutta Percha and Rubber Ltd.; manager, secretary and assistant, Mr. Smith.

Dunlop Canada, Ltd., reports that net profit in 1954 amounted to $115,000 compared with $299,000 in the previous year. The decline in earnings was due to intense competitive conditions, particularly in tires, and selling prices could not be adjusted to reflect increased costs, the company stated. Also, during 1954, the company incurred considerable abnormal expense due to the preparations for operations of the new factories at Whitby.

The appointment of Eric L. Hamilton, C.A., to the board of directors of Canadian Industries (1954) Ltd., has been announced by H. Greville Smith, president. Mr. Hamilton is treasurer of the company. Born in Montreal, he is a graduate in commerce of McGill University and joined Canadian Industries, Ltd., in 1937. He became chief accountant in 1946 and assistant treasurer three years later. He was appointed to his present position as treasurer in 1954.

RUBBER and PLASTICS EQUIPMENT ... designed ... and built by ERIE ENGINE & MFG. CO.



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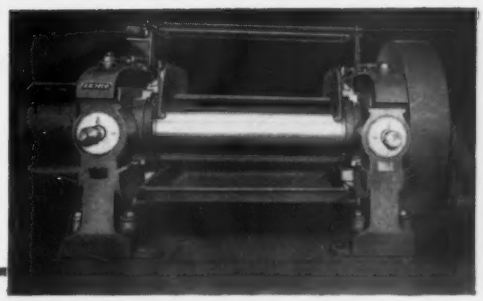

MILLS 22" x 60" shown. Available in all sizes from 6" x 12" to 26" x 84".

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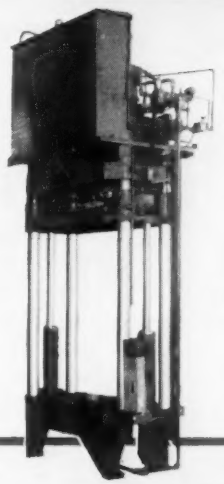

60" x 42" Reinforced Plastics Molding Press—236 tons. Down acting, fast traverse. Available in all sizes from 12" x 12" to 84" x 144" and larger—either up or down acting.

42" x 42" SIDE PLATE PRESS—1300 tons. Other sizes from 20" x 20" upwards.

51" x 123" LAMINATING PRESS—3300 tons. Custom built to individual specifications in any size.

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OBITUARIES

K. C. Gardner

K. C. Gardner, president and chairman of the board of the United Engineering and Foundry Co., Pittsburgh, Penna., died on April 15. He was 78 years old. After graduation from the University School and the Case School of Applied Science in Cleveland, Ohio, Mr. Gardner joined the Lloyd Booth Co., a predecessor of United Engineering, in Youngstown, Ohio, in 1899. When United was founded in 1901, Mr. Gardner was appointed machinery sales engineer. He was elected to the board of directors in 1911, vice-president in 1928, and in 1929 became general manager of sales. In 1943, he was appointed president and general manager and in 1952 became chairman of the board of directors. Mr. Gardner was also a director of the Peoples First National Bank & Trust Co., Woodings Verona Tool Works, Pittsburgh Testing Laboratory, Greater Pittsburgh Parks Association, Adamson United Co., Akron, Ohio, and Stedman Foundry & Machine Co., Aurora, Ind. He was a member of the American Iron & Steel Institute, the Iron & Steel Institute of Britain, A. S. M. E., Advisory Board of Pittsburgh Ordnance District, the U. S. Chamber of Commerce, Newcomen Society, the Duquesne Club, the Allegheny Country Club, the Edgeworth Club and the Youngstown Club. Surviving are his wife, three daughters and two sons.

George M. Miller

George M. Miller, chairman of the board of the Turner-Halsey Co., textile selling agents, died on April 24 of a cerebral hemorrhage. He was 67 years old. Mr. Miller began his career in the textile industry in 1904 as an office boy. Two years later he joined the J. Spencer Turner Co., which became Turner-Halsey Co. in 1908. Mr. Miller was appointed president of the company in 1930 and chairman of the board in 1951. He was also a director of Mount Vernon-Woodberry Mills, Arcade Cotton Mills and Carhal Factors. A resident of Great Neck, N. Y., Mr. Miller belonged to various clubs and was a member of the board of governors of the Merchant Club. He is survived by his wife.

Charles Vining

Charles Vining, formerly associated with the Goodyear Tire & Rubber Co., died on April 15 at his home in Worthington, Ohio. He was 59 years old. At the time of his death, Mr. Vining was district manager for the S. Gumpert Co. of Jersey City, N. J. During his association with Goodyear, he was with the Crude Rubber Division and had also spent eight years in Singapore for the company. Mr. Vining is survived by his wife.

Frank K. Espenhain

Frank K. Espenhain, former executive vice-president of the Fisk Rubber Co., New York, N. Y., died on April 5 in Miami, Fla. He had lived in Florida with his wife, who died on March 26, for the past 15 years. Mr. Espenhain began his business career in Milwaukee, Wisc., with a department store, serving as president and general manager. Later he disposed of his interests there and was engaged in the bond and advertising business. During World War I, he was placed in charge of securing and operating warehouses for Army supplies. He attained the rank of Colonel. After the war, Mr. Espenhain engaged in the exporting of tires, tubes and other rubber products with offices in New York City. He joined the Goodyear Tire & Rubber Co. in 1921 and was made manager of the Export Department. Later he became assistant to the president and first vice-president. After resigning from Goodyear in 1928, Mr. Espenhain joined Fisk Rubber. He had been retired for a number of years at the time of his death. Surviving is one sister.

Robert T. Brown

Robert T. Brown, development administrator for the Goodyear Tire & Rubber Co. for the past 10 years, died on April 27 in Akron, Ohio. He was 58 years old. Mr. Brown joined Goodyear in 1917 as a member of the original summer college squadron. Following his graduation from Georgia Institute of Technology in 1918, he became a tire design engineer with the company in Akron. In 1922, he was made manager of technical service in New Toronto, Can., and in 1925 became development manager there. He served as development manager of technical service in Wolverhampton, England, for 7 years, returning to Akron in 1934, when he was appointed assistant manager of tire design. During World War II, he served as manager of military products. Mr. Brown was active in the American Society of Automotive Engineers. Surviving are his wife and three daughters.

Dr. Gustav Egloff

Dr. Gustav Egloff, one of the world's foremost petroleum scientists, died on April 29 in Chicago, Ill., after a brief illness. He was 69 years old. Dr. Egloff was research director of the Universal Oil Products Co. of Des Plaines, Ill. He joined the company in 1915. In his years as research director, Dr. Egloff made many important contributions to the petroleum refining industry. He held 300 patents relating to the processing of petroleum oil, coal, shale oil and chemical derivatives of hydrocarbons, and was the author of 650 articles on petroleum and the chemistry of hydrocarbons. Dr. Egloff was the recipient of the Chemists' Gold Medal in 1940, the National Research Council's Distinguished Service Award in 1941, and was elected a fellow of the British Royal Society of Arts in 1950. He was past president of the American Institute of Chemists and of the Western Society of Engineers.

Norman J. Elder

Norman J. Elder, vice-president and manager of the Calender Division, Adamson United Co., Akron, Ohio, died on April 18 as the result of an accident in a gymnastic exhibition. He was 37 years old. Born in Carnegie, Penna., Mr. Elder went to Akron with his parents and attended public schools there. In 1941, he was graduated from the University of Akron with a B.S. degree in mechanical engineering. During World War II, he served in the U. S. Navy, rising to the rank of Lieutenant. After service with the Morse Instrument Co. as assistant chief draftsman, he joined Adamson United in 1946. He was made a vice-president in 1954. Mr. Elder was a member of many business, technical and social organizations and was on the editorial advisory board of "Plastics Technology." He is survived by his wife and three children.

All-Rubber Sprinkling System

The Goodyear Tire & Rubber Co., Akron, Ohio, is marketing an all-rubber underground lawn-soaking system especially for the "do-it-yourself" trade. Materials for the all-rubber sprinkler are said to cost about 40% less than those for an all-metal system. Installing the system involves two easy stages, planning and actual installation. All the home gardener has to do is figure how many sprinkler heads and how much rubber pipe is needed, locate the heads on graph paper, stake out the system on the lawn and assemble it with adhesive. After it is thoroughly tested, the "do-it-yourselfer" has only to slit the sod to a depth of four to six inches and tamp down the rubber pipe with a board. The sod can be returned to normal then by tamping on each side of the slit with the feet. Any pattern can be laid out, the company states. Rubber pipe is flexible enough so that it can be run around trees and curved around bends. Rubber sprinkler heads set level with the ground are safe for children and will not damage lawnmowers.

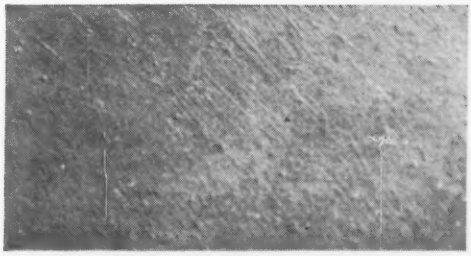
Rubber Cultivation in Brazil

Firestone Tire & Rubber Co. has submitted proposals to the Brazilian government for the cultivation of natural rubber. These plans involve the purchase of land by Firestone in Bahia, and the letting of nearby land to Brazilian farmers who would be benefited by the "know-how" supplied by Firestone technicians. Goodyear and Brazilian Pirelli have already bought some land in the State of Para, where they intend to develop plantations on a modern basis, providing housing, schools, medical assistance, etc.

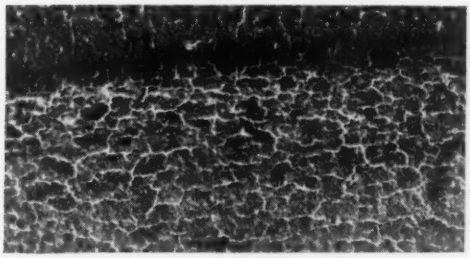
No sign of checking. The rubber insulation on this wire contains Sunoco Anti-Chek. Compare it with the sample at the right.

Surface checking is clearly evident in the rubber covering of this wire—which does not contain Sunoco Anti-Chek.

STOP SURFACE CHECKING AND CRACKING WITH SUNOCO ANTI-CHEK



Sunoco Anti-Chek keeps black sidewalls smooth... even after prolonged storage.



Notice the cracking and checking of the sidewall on this tire which does not contain Sunoco Anti-Chek.

Sunoco Anti-Chek is unique . . . there's no other anti-checking wax like it. It's a narrow-cut primary product, not a blend. It is completely controlled from crude oil to finished product by the same company that originally developed it. And it is made in the most flexible wax plant in the world. To you this means a completely uniform product that can be depended on for the same excellent results tomorrow, next year, 10 years from now!

Detailed information on the many advantages of Sunoco Anti-Chek is given in a new technical bulletin. To get a copy, call your Sun Oil Company representative or write Dept. RA-5.

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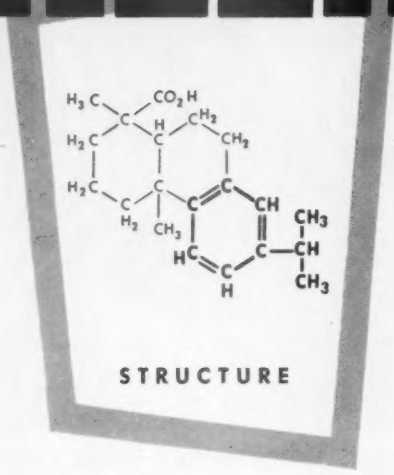
GALEX®



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for **GR-S, NEOPRENE, NATURAL RUBBER and RECLAIM.**

"Galex" is a stable rosin acid that effectively tackifies and plasticizes GR-S, Neoprene, natural rubber and reclaim. Because of its chemical structure, principally dehydroabietic acid, "Galex" is unaffected by oxidative aging and does not induce oxidation of elastomers in which it is used. It is highly compatible with various elastomers, resins and solvents.

"Galex" is widely used as a tackifier-plasticizer in hose, belting, mechanical goods and various friction stocks. It imparts strong surface tack which develops into excellent adhesion after cure. "Galex" also functions as a highly stable and compatible tackifier in rubber-base adhesives and cements.

Write for technical information and samples.

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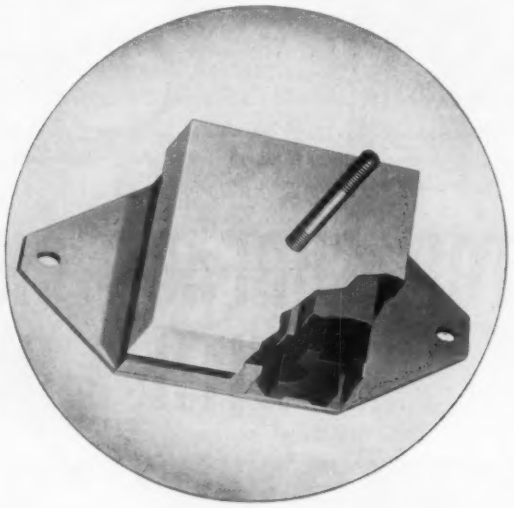
NEW GOODS

Hamilton Kent Rexon Mounts

Hamilton Kent Manufacturing Co., Kent, Ohio, has introduced "Rexon Mounts", designed to offer a permanent solution to the problems of machine vibration and to eliminate the confusing mathematics of calculating vibration dampening requirements of various types of machines. Rexon Mounts consist of one or more "X"-shaped neoprene rubber elements encased in steel channels. Under normal loading, the points of the "X" deflect enough to provide floating suspension, and thus prevent transmission of vibration from machine to floor, or floor



to machine. If overloaded, they merely become conventional compression mounts, but are not damaged in any way. Rexon Mounts are available in various sizes to support weights from ½ to 3,800 pounds. Installation is simple, the company states. The only information needed for proper installation is the direction of vibration, and the weight each mount will be required to bear. The company states that no maintenance is required for the mounts.

HELP!

ATTENTION TIRE MANUFACTURERS. Non-profit corporation representing 10,000 antique automobile enthusiasts desires to develop a source of high pressure tires for its members. Would prefer to deal with a tire manufacturer who has retained the original molds, however, cost of new molds could be amortized on first lot order or would consider making capital investment to cover cost of new molds.

Nationwide survey figures are available showing sizes and quantities desired by our members. No objection to manufacturer's identification on sidewalls. Resultant publicity through photo news releases on local, regional, and international basis of beautifully restored antique automobiles using tires of your manufacture, plus active assistance of our grateful members in your advertising program, offered as added inducement.

For full details please write to:

Horseless Carriage Club of America
c/o Tire Chairman
215 N. Larchmont Blvd.
Los Angeles 4, Calif.

Vinatred Vinyl Carpeting

Southbridge Plastics Corp., 241 Church Street, New York 13, N. Y., is manufacturing a flexible, cotton backed, continuous flooring material made of a polyvinyl chloride polymer. Called "Vinatred", the new material is a clear vinyl carpeting with an embossed, non-porous surface. Loose dirt can be removed with a vacuum and a bristle brush used with a detergent and water will remove most stains. Vinatred will not chip, flake or crack and cannot be attacked by moths. It does

not need waxing or polishing to keep it looking its best. There is no odor and it will absorb none. Easy to install over wood or concrete above grade, Vinatred is laid over an underlayment of sponge rubber. Adjoining seams of the material can be heat welded so as to form an unbroken wall-to-wall floor covering. The carpeting is available in rolls 36 inches wide and in varying lengths up to 50 yards.

Self-Adjusting V-Belt

Dayton Rubber Co., 2342 West Riverview Avenue, Dayton 1, Ohio, has developed a self-adjusting V-belt which is said to end fan belt noises and vibrations caused by faulty belt operation in home blower heater systems and cooling fans. The "Q.V.D." belt is made of a special blend of synthetic rubber and fabric and has a built-in "watchman" which automatically adjusts the tension level of the belt. This eliminates monotonous vibration noises caused by overly tight belts. It also minimizes motor and bearing wear. The Q.V.D. is 17/32-inch wide, 9/32-inch thick and has a 40 degree V angle. Its neutral axis is engineered to keep vibration to a minimum. Every belt is electronically tested to determine its vibration characteristics before it is sent out for blower or fan use, the company states.

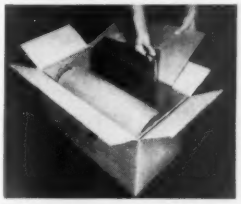
Major Passy Sponge Grip

Major Sales, Inc., 1842 Givan Ave., New York 69, N. Y., has introduced the "Major Passy Sponge Grip" for golf clubs. Made of neoprene and sponge rubber, the grip is said to have a unique Dri-Back adhesive that permits regripping of clubs by anyone. Designed by a golf "pro," the grips are said to eliminate shock, sting, blisters, callouses and slippage.

New Patapar Releasing Parchments

Better release...lower cost

The new releasing types of Patapar Vegetable Parchment have characteristics which make them ideal as a protective backing for pressure sensitive surfaces, separator sheets for uncured rubber, rubber tape, and as a wrapping material for tacky substances.



Effective separator sheet for uncured, natural, or synthetic rubbers

Separator sheet for rubber tape — releases readily

Some of Patapar's advantages:

- Dense, fibre-free surfaces
- Excellent release from tacky surfaces
- Releasing qualities remain constant as time passes
- High resistance against penetration or migration of rubber softeners
- Pressure sensitive surfaces retain full effectiveness
- Low cost

Send for Samples — We'll gladly send you technical data together with samples of the various new types of Patapar Releasing Parchments.

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Patapar®
Vegetable Parchment
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CARTER BELL PRODUCTS
1903
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Vulcanized
VEGETABLE OILS

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Types, grades and blends
for every purpose, wherever
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can be used in production
of Rubber Goods—
be they Synthetic, Natural,
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A long established and proven product.

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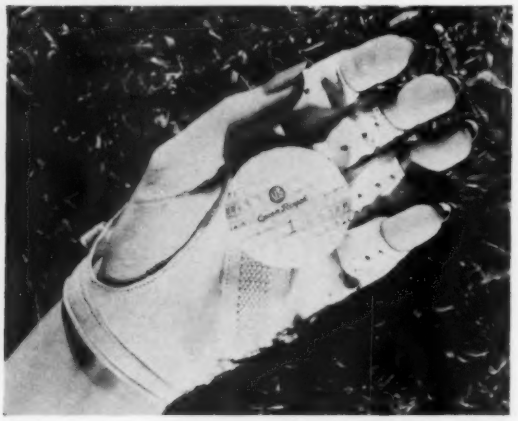
SPRINGFIELD, NEW JERSEY

Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angelos

U. S. Queen Royal Golf Ball

U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y., has introduced a new golf ball especially designed for the woman golfer. From center to cover, the new ball, called the "U. S. Queen Royal" is constructed to get maximum results from a woman's swing, the company states. The ball meets all the required



specifications of the U. S. Golf Association. It is 1.68 inches in diameter, 1.62 ounces in weight and has an initial velocity of 250 feet a second. It has a silicone center and is electronically wound for long, true flight and uniform performance, with the winding tailored to the woman's swing.

Turn-Style Slenderizer

Relax-It Vibrator, Inc., 10624 Ventura Boulevard, North Hollywood, Calif., is manufacturing a sturdy rubber exercising platform that rotates while the user stands on it. Made of thick, non-slip synthetic rubber,

the "Turn-Style" has a concealed counterweight which does the work and provides the resistance at the end of each swing. The Turn-Style needs no adjustments and will take up no more room than a small bathroom scale.

New Arctic Ground Shelter

B. F. Goodrich Co. Industrial Products Division, Akron, Ohio, in association with the Bendix Radio Division of Bendix Aviation Corp., Baltimore, Md., and the Rome Air Development Center, Rome, N. Y., has developed a new arctic ground shelter for the U. S. Air Force. The inflatable rubber structure is based on the engineering concept that columns of air provide structural strength. It will withstand 80-mile-an-hour winds and remain erect under snow loads up to 24 tons. The shelter is made out of 24 individual, arched synthetic rubber tubes, reinforced with nylon and placed side by side. When inflated with two pounds air pressure, the thin tubes form the vaulted roof and side walls of the shelter.

Although only 18 inches in diameter, the columns each support 2,000 pounds. As the tubes fill with air they rise and snap into position, forming an arch 16½ feet above the floor. The tubes enclose a floor area measuring 35 by 32 feet. A motorized blower maintains uni-

form pressure within the arches regardless of climatic change. About the size of a six-room house, the shelter will house 30 men in addition to radar equipment. To form the foundation for the shelter, 24 air tubes, 18 inches in diameter and 32 feet long, are placed side by side on the ground. When inflated, these sub-floor tubes conform to the contour of the ground and provide a level surface for a sectionalized plywood floor.

The interior of the shelter is coated with aluminum to insulate against heat loss. Two gasoline heaters can maintain comfortable temperatures within the shelter. The tubes are light green in color to brighten the interior and reduce eye fatigue. Front and rear ends of the shelter are formed around frames of tubular air columns. Inner and outer sheets of nylon reinforced rubber panels provide an 18-inch thick chamber of dead air space and are attached to the tubular frames to create double-walled insulation of the two end areas. Entrance to the shelter is through doors at either end. A tarpaulin-like roof and wall cover, made of vinyl-coated nylon, is laced to the tubular structure to weatherproof the shelter. Guy wires secure the shelter to the ground. Weighing 7,500 pounds, the shelter can be transported on a single truck and easily assembled in arctic areas.

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ARCCO C 510 Heat Seal Solution Laminant offers these advantages over direct calendering:

Spreader knife application of base coat, any time prior to lamination, simplifying production schedules.

Lamination and embossing accomplished in one pass, an important processing economy.

Small orders easily processed without upsetting calender schedules.

Laminating with ARCCO C 510 eliminates necessity of making up small lots of coating compound.

Non-reclaimable scrap vinyl compound eliminated.

Greater versatility. Fabric base coated with ARCCO C 510 can be laminated to vinyl film ranging from .004″ gauge to .020″.

Other ARCCO Heat Seal Solutions and Emulsions provide excellent adhesion to cotton, wool, rayon and leather, and can be tailor-made to meet your individual requirements.

An ARCCO engineer will be glad to call and give you complete information about the characteristics and uses of ARCCO C 510 Heat Seal Solutions and Emulsions for vinyl films and as Heat Seal Coatings for fabrics.

ARCCO offers a complete compounding service for emulsions, solutions and hot melts, both standard and specialized formulae. Feel free to consult our ARCCO Technical Service about your specific requirements.

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Complete line of standard sizes.
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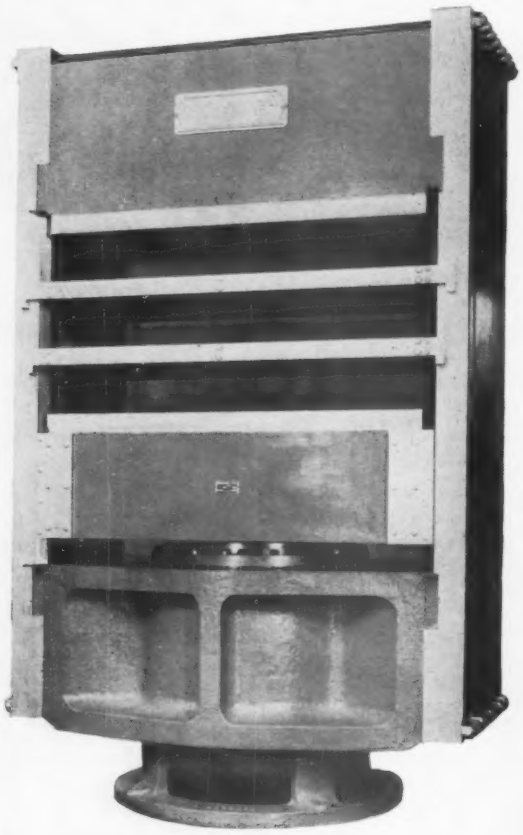


FRENCH PRESSES LOOK THE PART TOO

1134 ton hot plate molding press, 74" x 40" pressing surface.

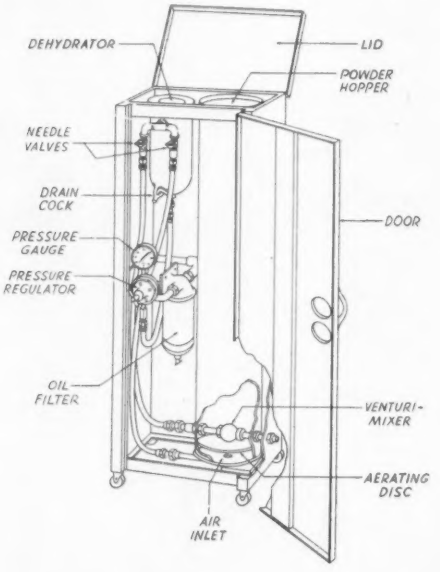
Write for Illustrated Catalog.

THE FRENCH OIL MILL MACHINERY CO.
(HYDRAULIC PRESS DIVISION)
1022 GREENE ST. PIQUA, OHIO

NEW EQUIPMENT

Randall Dusting Systems

Dusting systems designed by Ralph B. Randall, president of the Randall Dusting Corporation of Rye, N. Y., have been installed in literally hundreds of rubber factories in the United States and overseas. Some of these systems are utilized to dust rubber goods with coatings so light that they consume only about 3 pounds of powder in a full working day, while others are dusting so heavily that they consume as much as 217 pounds of



powder per hour. In the latter application, which is somewhat unique, the customer is dusting both sides of a web which is 55 inches in width and which travels at a speed of approximately 200 feet per minute.

The Randall systems are built around an automatic dusting machine that is described as being safe, simple and easy to install. Designed to spray dry powders, it achieves individual particle separation of dry solids ranging in mesh size from 70 to micro-pulverized. The dusting principle of these units is as follows: Using extremely low pressure and clean, bone-dry air as the carrier vehicle, powders are entrained and then deposited at the point of application. Each powder particle is separated from the other particles in the mass. The air carries the particle to the point of escape, such as the end of a hose, where the velocity suddenly drops and the particle slowly falls or attaches itself to the surface to be covered. In a sense, the powder acquires all of the characteristics of a fluid, and individual particle separation eliminates globs, agglomerates, flocculation or coalescence of powders, making possible exacting control of the deposit.

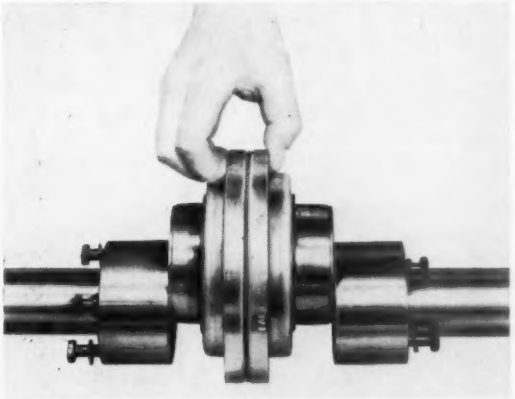
Operation of the Randall automatic dusting machine can be visualized from the accompanying schematic sketch. The unit has only one operating control—a pressure regulator which starts and stops the flow of powder

and also controls the density of the powder deposit. It performs in the following manner: (1) Air from the customer's compressor system is introduced into the duster; (2) The pressure regulator reduces the air pressure to a low operational pressure, from one-half to 20 pounds depending on application; (3) A special filter traps all traces of oil that may be present in the compressor system; (4) The cleaned air then passes through a silica gel dehydrator which extracts all moisture, making the air bone-dry; (5) The clean air then passes into a cylindrical powder reservoir through a porous stainless steel filter, thoroughly aerating the powder and sending it through a venturi mixer into a low pressure stream; (6) By means of flexible rubber hoses, the powder-laden air is brought to the point of application.

Made in three models for light, general utility and extremely heavy dusting applications, the Randall unit is only 36 inches high, 18 inches wide and 12 inches deep, and is mounted on casters for portability. In the rubber field it is used for dusting slab, sponge rubber, hard rubber, proofed goods, sheeting, channel moldings, extrusions, various tire casings, belting, floor tile, and other products. In the wire and cable field it is used to eliminate tack in insulations and to bond resins to textile webs. In the plastics field, it finds application in extruding, calendering, molding, printing, cutting and sewing.

Falk Spacer-Type Coupling

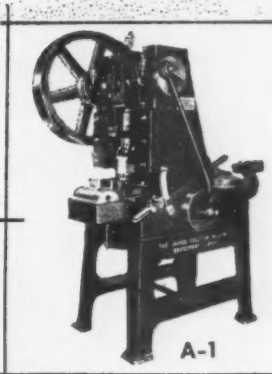
According to the Falk Corp., 3001 West Canal Street, Milwaukee 8, Wisc., operating and maintenance engineers will appreciate the practical design of the new Type F Steelflex Spacer coupling which makes it ideal for use between motors and pumps (where a gap between shafts must be provided to permit removal of pump impeller shaft assemblies) or on any application

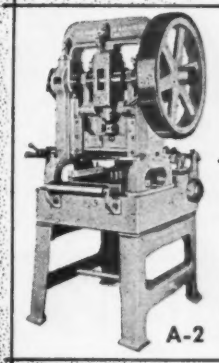


where a large gap (up to 12 inches) cannot be avoided. It is stated that over and above the protection which the Steelflex design offers against damage from impact loads and shaft misalignment, the Spacer coupling affords easy connection and disconnection of shafts, as shown in the accompanying photograph. Because the coupling is pre-lubricated at the factory, maintenance lubrication requires only the addition of lubricant by means of a grease gun once every six months.

COULTER

THE KEY TO HIGHER QUALITY CUTTINGS



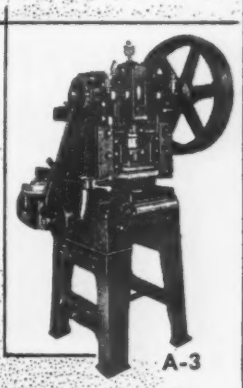


MODEL A-1
Cutting Heels at high speed production or short runs.

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.

MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.



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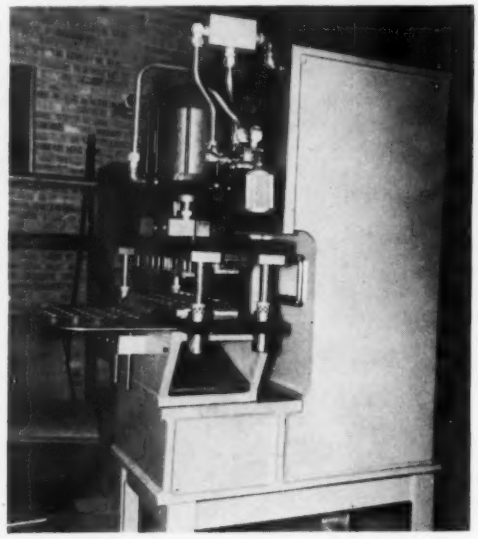
Altman Hy-Pro Air Press

Designed by rubber men with considerable production experience, the Hy-Pro Air Press is finding increasing application in the rubber manufacturing field. The press, which is equipped with a multi-trim, three-stage die which punches the inside diameter, splits the part on a 15 degree angle, and punches the outside diameter, is manufactured by the Altman Manufacturing Co., 1234 South Cicero Ave., Cicero, Ill., and is distributed by Francis S. Frost, 30 North LaSalle St., Chicago 2, Ill.

The Hy-Pro press is of all steel fabricated construction and requires an area of only 3 by 4 feet. It is 6 feet



high. The press is operated by 100 psi air pressure which is supplied by a one inch air line. It develops a cutting pressure of 5000 pounds, which is sufficient to trim either a pure gum or a very hard, tough stock. It is controlled by a bi-valve system with a back pressure safety feature; thus, the press cannot be operated with one valve and the die set is always held open.

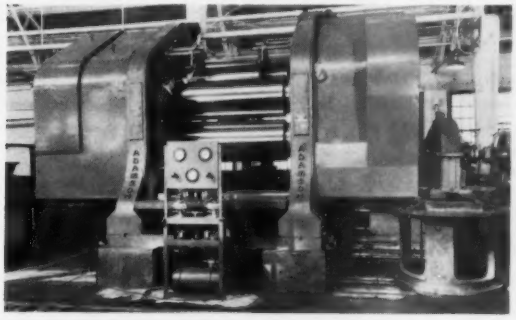
The multi-trim dies designed for the press offer many features. They may consist of one row of cavities to as many as several hundred cavities in each die. It may be a simple trim operation or several operations in one die. The dies are mounted on specially-designed sets with ball bearing races for the leader pins to ride in, which is said to assure perfect alignment at all times and practically friction-free operation.

According to the manufacturer the advantage of this trim method is that the high volume trim allows mass inspection of the heats as they come from the press room. Four to 10 die loads per minute are representative of normal operation, which means that rates as high as 15,000 to 50,000 pieces per hour can be trimmed. In one installation, man-hours in the trimming department are said to have been reduced to the point where one press and one operator are doing the same work as six to ten persons using conventional trimming equipment.

A new **barrel handling truck,** which is said to require no tipping or pick-up space when handling barrels touching each other, has been announced by Valley Craft Products, Inc., 760 Jefferson Ave., Lake City, Minn.

Adamson United 3-Roll Coating Calender

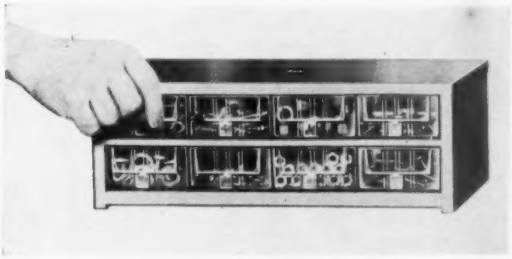
A new, three-roll calender especially adapted for coating work has been developed by the Adamson United Co., 730 Carroll Street, Akron 4, Ohio. It is a 120° type in which the top roll is moved 60° from the vertical plane. The tilt thus provided makes the top bank much easier to feed than it is in a conventional, vertical three-roll calender, and considerably reduces the effect of



center roll deflection on the work being done in the bottom pass. The calender is designed so that it may be equipped with a motorized crossed axis device for the offset roll, and conventional screw adjustment or hydraulic cells can be used on the bottom roll for applying pressure in the coating pass. The new calender is available in the 24 inch by 68 inch size, equipped with either full circle bronze or anti-friction bearings. Lubrication is supplied by an automatic greasing system. Circulating oil lubrication units are available at extra cost.

Eight-Drawer See-Thru Cabinet

Many small-parts storage needs can be met with the new Eight-Drawer See-Thru Cabinet recently added to the line of similar cabinets featured by the General Industrial Co., 5738 North Elston Ave., Chicago 30, Ill. The transparent plastic drawers enable the user to spot at a glance the drawer in which the desired parts are stored. Adjustable crosswise and lengthwise dividers,



furnished with the cabinet, make it possible to set up various sized compartments in the drawers and to establish an efficient method of "filing" small parts. The drawers have a safety catch so that they cannot be accidentally withdrawn. Slots are provided on the drawer fronts for labels, if desired. The cabinet measures 4 inches in height, 12½ inches in width, and 6 inches in depth. It is finished in silver-grey baked enamel and has rubber feet to protect desk and counter tops.

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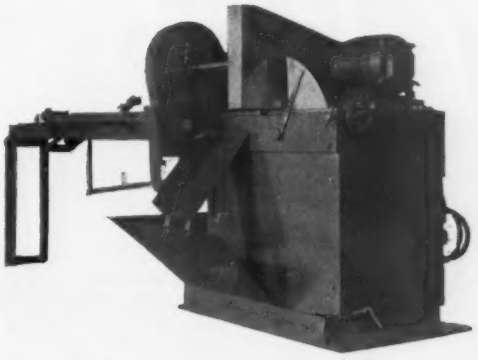

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REVIEWS

BOOKS

New Practical Formulary. By Mitchell Freeman. Published by the Chemical Publishing Co., Inc., 212 Fifth Ave., New York, N. Y. 5½ x 8½ in. 400 pp. $7.95.

Nearly 2,500 carefully tested and evaluated formulas, many never before disclosed, are listed and explained in this comprehensive and detailed one volume compendium of workable formulas and processes. Clear, concise, easy-to-follow descriptions and instructions make this reference work of immediate value to every chemist and to every manufacturer of chemicals or investor in the constantly expanding chemical industries. The first part of the book gives a practical outline of the chemical manufacturing plant and lists explicit instructions for carrying out such basic operations as heating, dissolving, digesting, extracting, leaching, percolating, crushing, grinding and pulverizing, screening, evaporating, distilling, filtering, emulsifying, macerating, clarifying, crystallizing, drying, pumping, refrigerating and roasting. Individual sections are devoted to every conceivable and practicable branch of the chemical industries, from alloys, bleaches and cosmetics to industrial processes, pharmaceuticals and waterproofing. A full appendix and bibliography contain tables on weight conversion, Baumé degrees, temperatures, etc., including a carefully selected list of sources of supplies and machinery. Of particular interest are the sections devoted to rubber cements and rubber substitutes.

•

Principles of Emulsion Technology. By Paul Becher. Published by the Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 4¾ x 7 in. 150 pp. $2.95.

This book is written for those who have studied chemistry and are now desirous of learning more about both theoretical and applied emulsions than the passing mention given the topic in physical chemistry courses. Although the theoretical discussion is largely physico-chemical, those without formal training in the subject should be able to follow the presentation with minimum difficulty. The worker in the field will, perhaps, find little new in the portions of this volume dealing with applied problems; what has been attempted here is the presentation of general principles in terms of practical examples. As is well known, the actual formulation of emulsions is still largely an art; thus the principles indicated in this book are intended primarily to serve as a guide to emulsion technology. The following topics are considered in the book: Dispersions and emulsions, surface activity, theory of emulsions, the chemistry of emulsifying agents, emulsification equipment, the testing of emulsion properties, emulsion formulation and demulsification.

•

Paper Chromatography. By Dr. Friedrich Cramer. (Translated by Leighton Richards). Published by St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y. 6 x 9 in. 124 pp. $5.00.

Paper chromatography is a micro-analytical separation method which is finding steadily increased application in research laboratories. Offered as a laboratory manual on the subject, this book gives precise working directions for paper chromatographic techniques. It is divided into three sections, the first dealing with the theoretical background of partition methods, the second covering operating methods, and the third describing the separation of particular substances. Two transparent charts are provided for the identification of chromatograms. The book, incidentally, is a translation of the second German edition.

Pocket Book of Chemical Technology. By V. Stannett and L. Mitlin. Published by the Chemical Publishing Co., Inc., 212 Fifth Ave., New York, N. Y. 4½ x 7 in. 283 pp. $4.75.

This handy volume will be valued by chemists and chemical engineers as a time saver. It contains essential information frequently needed by chemical technologists in less bulky form than the very complete handbooks. Its approach is unique in that it includes both chemical and chemical engineering data. The material is presented in such a form that it should be useful to specialists, beginners, students and those technical workers in the various chemical industries who have had no formal educational background. The book is also intended for bench and plant workers and those who are engaged in the supervision of chemical processes, both in the laboratory and in chemical plants. Details of radioactive isotopes and labeled compounds have been listed to stimulate interest in this field which is destined to become important in the near future.

•

Surface Coatings and Finishes. By Philip L. Gordon and George J. Dolgin. Published by the Chemical Publishing Co., 212 Fifth Ave., New York, N. Y. 6 x 9 in. 299 pp. $9.00.

This book covers the application of the results of modern research to paint and varnish technology. It contains a wealth of information on synthetic resins, fast-drying and water resistant oils and their combination into scientifically formulated varnishes. The numerous tables, graphs and other illustrations and the techniques and apparatus described in detail will help the varnish maker and chemist to meet all physical and performance requirements placed by consumers on the finished products. The structure, origin, physical and chemical properties and practical value of plastic-type substances that have revolutionized the surface coating industry are presented to benefit students, manufacturers and research workers in pointing the way to the proper application of these materials.

•

Fiberglas Reinforced Plastics. By Ralph H. Sonneborn. Published by the Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 5¾ x 8¾ in. 244 pp. $4.50.

Written for both design engineers and executives in the materials industries, this book is said to be the first complete treatment ever published on the subject of reinforced plastics. It covers in full detail the resins and glass reinforcements used in reinforced plastics, molding techniques, inspection and testing, properties, and design considerations. Of special interest are two chapters contributed by leading authorities in engineering research. The first, written by Professor A. G. H. Dietz, head of the Department of Structural Materials at M.I.T., discusses the theory and fundamental concepts of reinforced plastics. The second, prepared by A. S. Heyser of Reed Research, Inc., deals with design from the viewpoint of the structural engineer.

•

Management of Expanding Enterprises. By William H. Newman and James P. Logan. Published by the Columbia University Press, 2960 Broadway, New York 27, N. Y. 5¾ x 8¾ in. 125 pp. $2.75.

This volume asserts that the success or failure of the free enterprise system in the United States depends upon how well the management of large-scale and expanding enterprises face critical issues in the next half century. These issues form the center of attention in this book, which is actually a report of round table discussions by leading business and professional men. The informal discussions, from which the report was prepared, attempted to precipitate the experience of some of the leading business executives and management consultants in the United States and to bring their judgments to bear upon the problems at hand.

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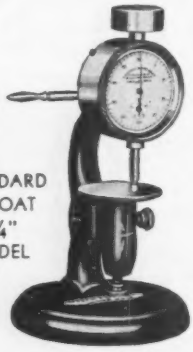

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BOOKLETS, CATALOGS, etc.

85% Magnesia Insulation Manual. (2nd Edition). The Magnesia Insulation Manufacturers Association, 1317 F St., N.W., Washington 4, D. C. 8½ x 11 in. 80 pp.

This new edition of the "85% Magnesia Insulation Manual" contains an explanation of the chemical and physical properties of 85% magnesia, together with new conductivity, density, and fire-resistance data. The new water-resistant magnesia insulation for underground conduits and other locations subject to flooding or excessive moisture is described. A section is devoted to recommended application techniques for hot piping and equipment. Tables include the new simplified thicknesses to which 85% magnesia and diatomaceous silica pipe insulation are manufactured, replacing the obsolete thicknesses such as "standard." Nominal and actual thicknesses are given for pipe sizes up to 24 inches. Lower conductivity (k-factor) of the modern product and adoption of "simplified thicknesses" required recalculation of heat loss tables. These are incorporated in the new edition for 85% magnesia pipe and block insulation and for combinations of diatomaceous silica and 85% magnesia insulation. They cover a wide range of operating temperatures of pipe sizes and insulation thicknesses. The complete data offered are applicable to hot piping and equipment for industrial, commercial, institutional, and marine, railway and other uses.

•

Rubber's Return to the Western Hemisphere. Public Relations Department, Goodyear Tire & Rubber Co., Akron, Ohio. 6 x 9 in. 24 pp.

This booklet recounts the history of the rubber plantation industry from its inception in the Western Hemisphere to its transfer and growth in the Middle East to the current establishment of a rubber plantation industry in Latin America. It is concluded that for our national security and for the combined welfare of the sister republics of the Western Hemisphere, a large-scale rubber plantation industry is both economically possible and desirable. In this regard, the booklet tells of the establishment of rubber plantations by Goodyear in Costa Rica. A series of photographs illustrate scenes on the plantations.

•

The Intermix. Francis Shaw & Co., Ltd., Corbett St., Ashton New Rd., Manchester 11, England. 8½ x 11 in. 20 pp.

The first Intermix was built in 1932. Since that time the design of the unit has been continually modified to meet changes in compounding techniques which have been frequent and radical in character during the last few years. This booklet describes the Intermix of today offering information on basic design and construction features. Advise on operation and maintenance is offered. The booklet includes cutaway drawings, photographs and diagrams illustrating the various parts of the unit which is available in a range of sizes from laboratory mixers as well as medium and large size production units.

•

Antioxidant 425. (Rubber Chemicals Technical Bulletin No. 840). Intermediate and Rubber Chemicals Department, American Cyanamid Co., Bound Brook, N. J. 8½ x 11 in. 24 pp.

Since the introduction of "Antioxidant 2246" in 1950, American Cyanamid has continued research on antioxidants, particularly in search of a material with good antioxidant properties combined with still lower tendencies to develop color on exposure to light and other aging conditions. Antioxidant 425 is the result of this search. This technical bulletin contains complete and up-to-date information on the properties and behavior of this new antioxidant which is recommended as a protector for white and light-colored rubber products where minimum discoloration is essential.

The Defense Materials System in Our American Industry. Business and Defense Services Administration, U. S. Department of Commerce, Washington 25, D. C. 6 x 9 in. 41 pp. (Available from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 25c a copy).

Sinclair Weeks, Secretary of Commerce, in a foreword to this publication, stresses the need for a "functioning material control system designed to permit rapid industrial mobilization in case of war. DMS serves this purpose," the foreword continues. "The rules have been made simple. All except the most essential paper work has been eliminated. Industrial contractors and subcontractors for programs of the Department of Defense and Atomic Energy Commission have the responsibility for acquainting themselves with the few remaining rules and regulations. This manual is designed to aid in this task. It has been arranged so that each type of contractor and supplier may find a handy reference to the general rules applicable to his defense contract operations." Key questions and answers on the essential points of the Defense Materials System precede the detailed description of instructions for defense contractors.

•

Methylene Chloride—Chloroform—Methyl Chloride—Carbon Tetrachloride. Solvay Process Division, Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y. 6 x 9 in. 28 pp.

Data on the diverse uses and the physical and chemical properties of the chloromethanes—methylene chloride, methyl chloride, chloroform and carbon tetrachloride—are contained in this booklet. In addition to data applying generally to the chloromethanes, the publication contains individual sections that supply specific figures and information on each of the products. Included are such items as toxicity, azeotropic data, flammability, solubility, shipping, handling and storage. The text, tables and graphs in the booklet were designed to be of particular interest to manufacturers of rubber products, textiles, paints, plastics, various types of chemical intermediates, etc.

•

Temperature Control Systems. (Bulletin F-6149-2). Wheelco Instruments Division, Barber-Colman Co., Rockford, Ill. 8½ x 11 in. 8 pp.

Intended for those interested in the application of automatic control to industrial process applications, this bulletin contains an informative section which will help in the selection of sensing elements and their correct use for the most satisfactory results. Control terminology, as well as rules to use as a guide for the selection of a proper method of control for process characteristics, are covered in this publication. Also contained in the bulletin is a complete explanation of the various types of control systems, ranging from two-position "on-off" to proportional position with automatic reset. The question of where to use each for best control results is clearly answered.

•

The Story of the Tire. Goodyear Tire & Rubber Co., Akron, Ohio. 6 x 9 in. 64 pp.

To read this booklet is to get a cross-sectional view of the automobile and air ages, of the rubber industry, of tires, of the Goodyear company and of the American business structure. The booklet traces the history of the rubber industry from its earliest historical references through the discovery of vulcanization in 1833 to the present. The booklet discusses the development of synthetic rubber, outlines the development and use of tire fabrics and gives a step-by-step description of the manufacture of a tire. Research activities entered into by the company are described. This interesting booklet is illustrated by diagramatic sketches and photographs.

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MARKETS

NEWS-PRICES

NEW YORK, MAY 6, 1955

Natural Rubber

Since our last report (April 7), the average price of spot rubber on the New York Commodity Exchange has moved in a range of 175 points, high for the period being 32.50c reached on April 12, and low being 30.75c reached on May 4. The average price of spot rubber for the month of April was 31.75c based on 20 trading days. This compares with an average of 31.08c in the previous month.

With the close of the Second International Rubber Quality and Packing Conference in New York on May 6, many in the rubber trade are convinced that sooner or later natural rubber prices must get down to levels that are competitive with synthetic rubber. It is felt that this competition will become progressively keener as synthetic production expands.

For the immediate future, however, it is expected that the market will exhibit a firm tone. This is believed to be so because of three factors: (1) Limited consumer buying withtin past weeks; (2) The likelihood of increased buying to replenish rotation rubber; (3) The absence of first hand offerings during the past few weeks.

Malayan "White Paper"

In a recently issued "White Paper," the Government of Malaya states that increasing competition with synthetic rubber makes a reduction in the cost of natural rubber of primary importance. The White Paper declares that there is, at present, no indication that the disposal of the synthetic plants to private industry in the United States will result in an increase in the price of synthetic.

"Experience suggests that replanting with high yielding rubber trees can reduce estate costs to levels at which they can undoubtedly compete with synthetic at or even below the present selling price for that product," the White Paper asserts.

"In general, the long-term replanting objective may be described as the replacement as quickly as is economical and practicable of the low yielding ordinary rubber trees by new high yielding material which will appreciably reduce the cost of producing rubber in the Federation," the report states. (The Malayan government recently approved a $90,000,000 aid plan for the Malayan rubber industry).

Record-Breaking Consumption

There is every indication that U. S. new rubber consumption in April will equal or possibly exceed the record established in March when 135,287 long tons were consumed. Natural rubber consumption in March totaled 58,189 long tons. If consumption of natural rubber in April equals or exceeds the figure for March, it will mean that consumption will have outstripped imports. This in turn indicates a decrease in stocks of natural rubber or an increase in the quantities owed to the government stockpile. For the past several months, stocks of rubber in the hands of consumers have been slowly decreasing.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM APRIL 8 TO MAY 6

Apr.	Spot	May	July	Sept.	Dec.	Sales
8	....	....	....	....	....	....
9	....	....	....	....	....	....
10	....	....	....	....	....	....
11	32.15	32.35	31.55	31.20	30.75	141
12	32.50	32.60	31.85	31.35	30.85	78
13	32.12	32.45	31.40	30.95	30.45	120
14	31.62	31.80	31.03	30.45	30.05	123
15	31.75	31.95	31.10	30.50	30.05	23
16	....	....	....	....	....	....
17	....	....	....	....	....	....
18	32.12	32.65	31.75	31.25	30.80	123
19	31.75	32.25	31.50	31.00	30.50	46
20	31.75	32.05	31.60	31.05	30.65	92
21	32.25	32.25	31.95	31.50	31.25	308
22	32.12	32.10	31.95	31.45	31.05	138
23	....	....	....	....	....	....
24	....	....	....	....	....	....
25	31.75	31.65	31.40	30.85	30.45	133
26	31.88	31.77	31.60	31.10	30.70	112
27	31.62	31.65	31.45	30.85	30.45	121
28	31.38	31.15	31.11	30.65	30.20	141
29	31.62	31.40	31.36	30.90	30.60	71
30	....	....	....	....	....	....
May						
1	....	....	....	....	....	....
2	31.00	30.95	30.85	30.45	30.05	54
3	31.25	31.08	31.08	30.70	30.25	103
4	30.75	30.50	30.75	30.40	30.10	80
5	31.12	31.10	31.15	30.60	30.35	25
6	31.25	31.00	31.27	30.90	30.50	28

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.31¼
May	.31¼
June	.31¼
Thin Latex Crepe:	
Spot	.33¾
Thin Brown Crepe, No. 2	.28½
Flat Bark Crepe	.25⅝

London Market

(Standard Smoked Sheets)

June	31.06 - 31.20
July-Sept.	30.62 - 30.76

Singapore Market

(Standard Smoked Sheets)

June	29.38 - 29.45

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .500
Butaprene NL	.500 - .510
Butaprene NAA	.540 - .550
Butaprene NXM	.580 - .590
Chemigum 30N4NS	.500 - .510
Chemigum 50N4NS	.500 - .510
Chemigum N3	.580 - .590
G-E Silicone Rubber (compounded)	2.50 -3.60
G-E Silicone Gum (not compounded)	4.00 -4.20
Hycar OR-15	.580 - .590
Hycar OR-25	.500 - .510
Hycar OS-10	.550 - .560
Neoprene Types AC and CG	—— - .550
Neoprene Type GN	—— - .410
Neoprene Type GN-A	—— - .410
Neoprene Type GRT	—— - .420
Neoprene Type KNR	—— - .750
Neoprene Type S	—— - .420
Neoprene Type W	—— - .390
Neoprene Type WRT	—— - .450
Paracril B	.500 - .510
Paracril BJ	.500 - .510
Paracril C	.580 - .590
Polysar "S" Types	—— - .230
Polysar Butyl Types	—— - .230
Polysar Krynol	—— - .189
Polysar Krynol NS	—— - .194
Polysar Krynac	.500 - .510
Polysar Krynac 801	.580 - .590
Polysar SS-250-K	.300 - .310
Silastic (compounded)	1.95 - .338
Thiokol Type A	—— - .470
Thiokol Type FA	—— - .640
Thiokol PR-1	—— - .950
Thiokol Type ST	—— -1.000

Middling Upland Quotations

	Apr. 7	May 6		
	Close	High	Low	Close
May	33.70	34.23	34.17	34.23
July	33.89	34.10	33.98	34.08
Oct.	33.95	34.12	34.03	34.11

Synthetic Rubber

With the transfer of the synthetic rubber facilities to private hands, the trade is looking to the question of markets and what may be expected in the months that lie ahead. At the moment, demand for all types of rubber is at a high level. Most of the synthetic rubber plants have been operating at or near capacity levels for the past few months to meet the record demands of heightened automobile production.

Many in the trade believe that the long-term outlook is equally reassuring. Economists are generally agreed that by 1960, U. S. demand will be up about 40% over what it was five years ago. The natural rubber industry will not be able to meet this rising demand for new rubber and still meet the rising requirements of other consuming countries.

Bright Future Foreseen

And so it is that many foresee a period of expansion for the American synthetic rubber industry. It has been estimated that future expansion plans of the synthetic rubber industry in the United States will call for an outlay of from $200,000,000 to $300,000,000 in the next five years.

Present plans call for modest expansion of existing facilities. For the immediate future, some companies will raise capacity through such relatively inexpensive means as in the installation of equipment to mix inexpensive oil extenders into synthetic rubber. Other firms have announced plans to expand production of cold rubber. Plans calling for an increase in latex production have also been announced.

It has been reported that nearly all of the new owners will take steps to provide a more diversified range of rubbers from their plants in order to compete for customers. Heretofore, under government ownership, a customer whose synthetic rubber requirements couldn't be met by one plant was satisfied by output from another.

Basic Selling Prices

For the time being, basic selling prices are being held to the 23c a pound f.o.b. producing plant, previously charged by the government. With present high demand and low-cost raw materials, it is estimated that this price will return a fair profit.

How long this situation will last depends on a great many factors. Copolymer plant purchasers can be expected to put more of their research dollars to work in the development of new and better rubbers. They will be limited, however, by the fact that the plants are ten to twelve years old and not too much can be done to redesign these facilities. Many new developments may have to await the construction of new facilities.

If demand for synthetic rubber drops any appreciable amount, unit production costs will rise. Synthetic rubber is close to being a fully-automated industry. It costs almost as much to operate a plant at 75% of capacity as it does to operate at 100% capacity.

A big question on future costs is what the petroleum firms who took over most of the butadiene plants will charge for butadiene. The butylenes from which butadiene is made find extensive use in aviation fuels. If petroleum firms find it more profitable to market the butylenes for fuels, synthetic producers may have to pay more than they do at present in order to obtain the necessary quantities of butadiene.

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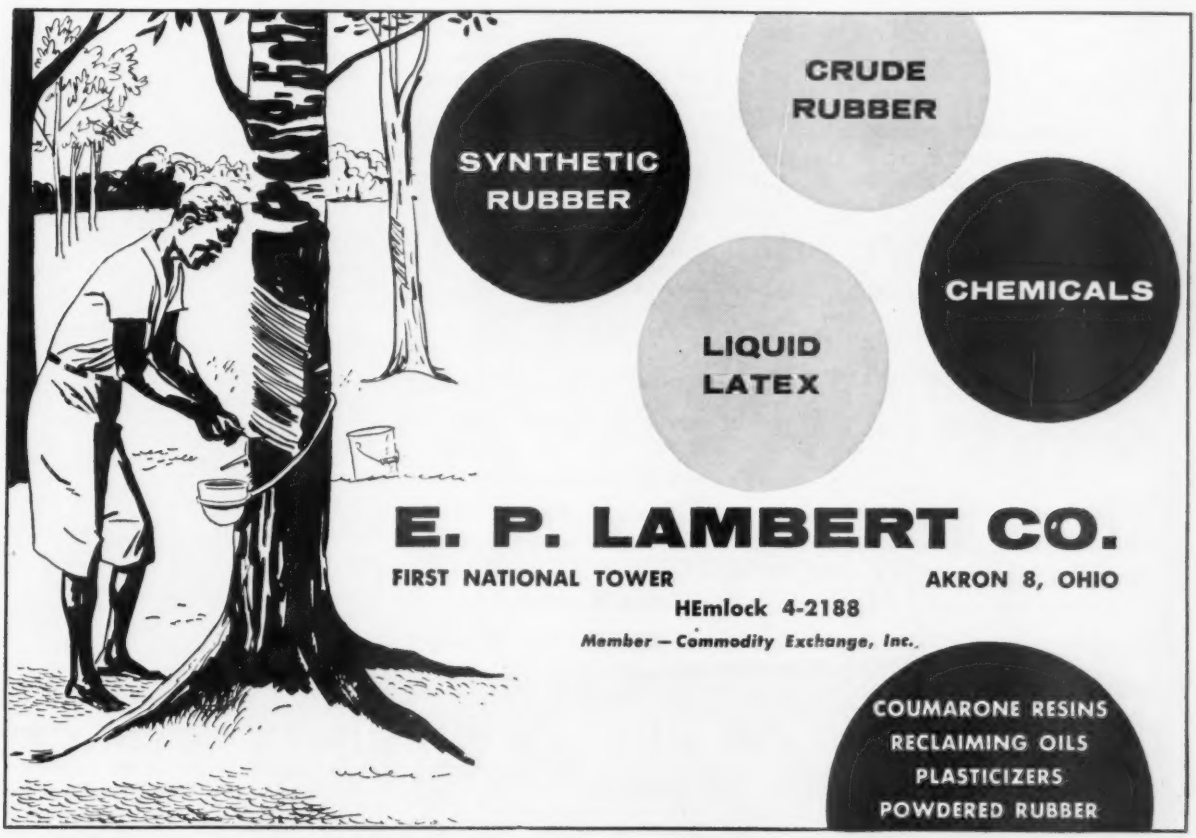

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RECLAIMING OILS
PLASTICIZERS
POWDERED RUBBER

MARKETS

NEWS-PRICES

NEW YORK, MAY 6, 1955

Reclaimed Rubber

According to reports from the trade, the reclaimed rubber market has been operating at a fairly high level during the past few weeks with most plants working a five or six day week. Prices remain stable with no changes reported during the period. The heightened activity manifested for Butyl tube reclaim some weeks earlier has now slackened off and the market for this type of reclaim is said to be quiet.

The U. S. Department of Commerce reports that 25,283 long tons of reclaimed rubber were produced in February, just about 50 long tons more than were produced in January. Consumption in February, set at 25,347 long tons was only about 10 long tons more than in the previous month. As of February 28, there were 29,836 long tons of reclaimed rubber on hand, about 180 long tons more than at the end of the previous month. Current prices for reclaimed rubber, as reported by producers, follow:

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.15
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

United States exports of scrap rubber in 1954 fell slightly below the previous year's total, according to the Bureau of the Census, U. S. Department of Commerce. Scrap rubber exports to all countries reached 30,522,059 pounds with a value of $763,228, compared with the 1953 total of 30,774,452 pounds valued at $823,175. Shipments to Canada and Mexico fell off almost 33%, accounting for the major part of the decline in 1954.

Spain continued to be the largest importer of U. S. scrap rubber. Total shipments to that country amounted to 9,211,280 pounds. Shipments to West Germany fell off slightly, but not enough to prevent that country from being the second largest importer of scrap rubber with 4,337,542 pounds. The United Kingdom was high on the list of importers with 1,837,462 pounds.

(Prices Delivered Akron)

Mixed tires	ton	14.50
Light colored carcass	lb.	.05½
No. 1 peelings	ton	45.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	17.00
Truck and Bus S.A.G.	ton	17.00
Passenger S.A.G.	ton	15.00
Natural Rubber Red Tubes	lb.	.07½
Natural Rubber Black Tubes	lb.	.05¾
Butyl Rubber Tubes	lb.	.06

Tire Fabrics

It has been reported by the trade that the demand for high tenacity rayon yarn for tire use, which began picking up last autumn, is likely to remain strong through at least, the first half of this year. Tire and rubber companies are said to be buying just about all the high tenacity rayon which rayon producers can give them, with most buying being done on a month-to-month basis.

Tire producers are expected to continue covering heavily each month through at least June. Demand for the second half also is likely to be strong, according to some observers.

March Shipments High

Shipments of high tenacity rayon yarn for tire cord and other uses hit the highest total in March since the middle of 1953; a total of 39,100,000 pounds. Production also rose substantially in the month to 37,400,000 pounds while stocks at the end of the month declined by 1,700,000 pounds to 6,500,000 pounds.

Shipments of high tenacity rayon yarn, including both domestic and export, reached 32,300,000 pounds in February and 31,400,00 in January. In December, it reached a total of 34,000,000 pounds. Production followed a similar trend, hitting 30,900,000 pounds in February, 32,200,000 in January, and 34,500,000 pounds in December.

Tire Cord Output Declines

According to the Census Bureau, total output of tire cord and fabric during 1954 amounted to 414,000,000 pounds, a decline of 21% from 1953. It has been previously noted that consumption in the third quarter of 1954 was adversely affected by strikes at the plants of two tire manufacturers. Further, it is understood that tire manufacturers reduced their inventories during the year.

By product, the use of cotton tire cord and fabric in 1954 continued small. On the other hand, the production of nylon cord and fabric increased from 19,000,000 pounds in 1953 to 30,000,000 pounds in 1954.

Being by far the largest part of the tire cord and fabric business, the rayon product took the brunt of the industry decline in 1954, that figure being 24% below 1953.

In 1953 and again in 1954, cotton cords and fabrics (chafer fabric excluded) took 3% of the total tire cord and fabric market. The rayon product took 93% of the market in 1953 and 89% in 1954, while the nylon product took 4% in 1953 and 8% in 1954.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73

Nylon Tire Cord

210	lb.	2.00
840	lb.	2.00

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½

Cotton Chafers

14.4 oz. (per square yard)	lb.	.71
9.25 oz. (per square yard)	lb.	.66½
11.65 oz. (per square yard)	lb.	.62
8.9 oz. (per square yard)	lb.	.68

Liquid Latex

Natural: According to Latex & Rubber, Inc., April saw a continuance of heavy pressure in the market and in obtaining physical delivery of previously purchased stocks. It is reported that there are buyers still with open spots in their estimated requirements through June and into July. Relief of the pressure, from curtailment of automotive production, has not come and is not expected until the early fall.

It is also noted that by early fall the inventory position of Hevea latex in the United States will be so low that a rapid build-up will be necessary. This indicates the probability of a continuing market demand. April prices for ASTM Specification Centrifuged Concentrate ranged from 39¾ to 44c per pound dry solids for spot and/or nearby delivery. Price expectancies appear to be mixed, with some quarters feeling still higher prices may be reached.

Synthetic: It is estimated that in March of this year, 6,500 long tons of GR-S latex were produced, compared with the 5,483 long tons produced in the previous month. March consumption is estimated at 5,500 long tons, contrasted with the 4,816 long tons consumed in February.

As for neoprene latex, it is estimated that 800 long tons were produced in March and 900 long tons consumed. In the previous month, 797 long tons were produced and 744 long tons consumed.

The amount of N-type latex produced in March is estimated at 600 long tons and the amount consumed at 500 long tons. In the preceding month, 641 long tons were produced and 477 long tons consumed.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in the range of 105 points since our last report (April 7), high for the period being 34.90c reached on May 4, and low being 33.85c reached on April 20. The average price of middling uplands for the month of April was 34.23c based on 20 trading days. This compares with an average of 34.33c in March.

According to the International Cotton Advisory Committee, the free world supply of cotton for the current season will total about 46,500,000 bales. This compares with 45,700,000 bales last season, and the five year 1949-53 average of 41,100,000 bales. Free world disappearance of cotton has increased slightly this season, and indications point to total disappearance of about 27,900,000 bales, the largest on record. Disappearance last season totaled 27,500,000 bales.

Production of cotton in the free world this season will total approximately 28,300,000 bales, almost 2,000,000 bales less than 1953-54 production. Allowing for cotton destroyed and probable exports to the Communist countries, production and total disappearance for the free world in 1954-55 will likely be in balance for the first time since 1951. The August 1, 1955 free world carryover will likely total about 18,600,000 bales, with stocks in the United States comprising over one half the total.

The Agriculture Department estimates that exports of cotton from the U.S. in the latter half of the current season are not expected to be as large as the 2,250,000 bales shipped abroad during the February-July period last season.

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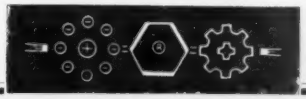

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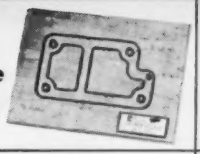

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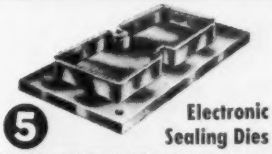
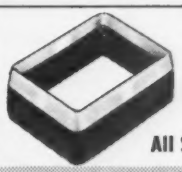
2 Steel Rule Clicker Dies



5 Electronic Sealing Dies



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STATISTICS

of interest to the rubber industry

Natural Rubber in the United States

(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1926	417,643	366,200	17,671	72,510
1927	431,246	373,000	27,775	99,282
1928	439,731	437,000	32,159	65,454
1929	565,087	467,400	36,485	118,609
1930	487,628	376,000	30,205	201,000
1931	501,788	355,200	25,609	322,000
1932	414,668	336,700	20,937	379,000
1933	418,902	412,400	20,576	365,000
1934	463,018	462,500	23,856	355,000
1935	467,146	495,500	11,391	303,000
1936	488,145	575,000	12,582	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1952	805,997	453,846	3,024	95,260
1953	647,150	553,473	8,376	112,316
1954	596,848	596,285	7,443	104,543
1954:				
July	40,614	39,894	565	109,564
Aug.	59,124	38,069	359	124,810
Sept.	48,618	52,412	499	119,191
Oct.	49,432	55,970	904	115,970
Nov.	45,474	53,326	798	105,025
Dec.	43,557	55,096	775	102,943
1955:				
Jan.	49,941	56,911	909	101,050
Feb.	50,880	50,997	718	97,189
Mar.	.....	58,189	814	102,233

Source: U. S. Department of Commerce.

U. S. Imports of Natural Rubber

Year	Dry: Long Tons	Dry: Declared Value	Latex: Long Tons	Latex: Declared Value	Total Imports
1937	574,600	237,307,041	23,185	10,213,670	597,785
1938	397,640	125,373,864	11,944	4,168,127	409,584
1939	469,946	167,586,780	27,437	10,467,583	497,383
1940	781,202	303,308,823	33,789	14,593,466	814,991
1941	989,498	401,976,317	34,797	15,965,627	1,024,245
1942	266,276	112,537,426	10,646	5,630,667	276,922
1943	50,358	31,369,198	1,890	1,312,202	52,248
1944	103,847	73,908,549	3,091	2,092,211	106,938
1945	134,408	95,814,102	4,773	3,115,853	139,181
1946	376,502	228,796,110	8,421	5,843,085	384,923
1947	691,087	306,951,814	17,542	9,787,722	708,629
1948	702,293	299,849,177	32,745	18,288,223	735,038
1949	630,808	225,343,624	29,743	14,968,650	660,551
1950	747,109	416,222,598	54,401	41,764,486	801,510
1951	677,874	727,343,348	54,963	80,178,309	732,837
1952	756,987	578,179,519	48,228	40,563,116	805,215
1953	571,635	284,909,223	75,511	46,353,333	647,146
1954:					
June	60,108	23,432,566	6,590	3,515,531	66,698
July	35,334	14,694,340	5,236	2,915,484	40,570
Aug.	51,553	22,840,397	7,571	4,374,067	59,124
Sept.	42,138	18,658,983	6,480	3,904,819	48,618
Oct.	42,221	19,902,225	7,210	4,469,492	49,431
Nov.	39,139	19,244,326	6,335	3,944,396	45,474
Dec.	34,668	18,272,151	8,889	6,208,294	43,557
1955:					
Jan.	42,088	22,245,606	7,853	5,473,260	49,941

Source: Bureau of the Census, U. S. Department of Commerce.

World Production of Natural Rubber

(Including Latex)

(Long Tons)

Year	Malaya	Indonesia	Ceylon	Viet Nam & Cambodia	Latin America	Rest of World*	Total*
1943	75,000*	100,000*	105,500	70,370	41,900	72,507	465,000
1944	25,000*	50,000*	98,500	60,419	49,946	77,000	360,000
1945	8,600*	10,000*	97,500	12,000*	47,125	73,570	250,000
1946	403,719	175,000*	94,000	19,975	39,678*	105,080	837,500
1947	646,362	277,951	89,000	38,128	34,928*	172,782	1,260,000
1948	698,189	432,349	95,000	43,935	29,158*	225,557	1,525,000
1949	671,503	432,996	89,500	43,010	27,318*	225,659	1,490,000
1950	694,090	696,472	113,500	48,482	26,902*	280,299	1,860,000
1951	605,346	814,406	105,000	52,136	29,777*	278,262	1,885,000
1952	584,238	750,494	96,500	63,134	35,475*	261,211	1,790,000
1953	574,390	692,164	98,610	74,545	35,318*	249,932	1,725,000
1954	584,435	745,322	93,935	74,247	26,833*	276,862	1,802,500
1954:							
June	43,202	54,696	7,713	6,232	1,282*	23,509	137,500
July	54,014	72,970	8,014	7,160	2,159*	22,794	165,000
Aug.	52,509	58,980	7,961	6,650	1,687*	21,470	150,000
Sept.	53,552	70,013	8,229	6,345	2,322*	23,741	165,000
Oct.	50,251	69,518	7,545	7,403	2,505*	24,169	160,000
Nov.	54,834	61,056	9,893	8,470	2,621*	25,313	162,500
Dec.	54,645	71,460	11,157	9,502	500*	30,764	180,000
1955:							
Jan.	57,181	59,230	9,614	14,369	500*	.....	160,000

Source: International Rubber Study Group. * Estimated.

World Consumption of Natural and Synthetic Rubber

(Including Latex)

(Long Tons)

Year	United States	United Kingdom	Canada	Europe*	Rest of World*	Total*
1943	488,525	66,730	32,896	150,000	156,104	907,500
1944	710,783	86,977	34,310	132,500	160,690	1,125,000
1945	799,009	91,047	41,836	87,500	108,164	1,127,500
1946	1,039,296	126,770	39,196	145,000	115,804	1,467,500
1947	1,122,327	156,399	61,452	242,500	153,548	1,735,000
1948	1,069,404	196,286	62,121	392,000	182,379	1,902,500
1949	988,903	186,622	56,362	446,500	207,388	1,887,500
1950	1,258,557	222,425	68,695	448,500	287,055	2,285,000
1951	1,214,298	238,101	70,809	476,500	314,941	2,312,500
1952	1,261,413	202,179	67,099	550,000	254,901	2,335,000
1953	1,338,309	211,453	73,394	534,000	343,606	2,500,000
1954	1,233,412	237,612	71,656	537,500	393,844	2,175,000
1954:						
June	111,448	18,961	6,461	42,000	30,039	210,000
July	79,446	18,675	4,758	43,500	29,742	177,500
Aug.	80,120	15,206	4,774	39,250	36,476	175,000
Sept.	106,290	20,418	6,269	46,250	39,731	220,000
Oct.	114,279	24,105	5,756	47,750	31,244	222,500
Nov.	110,613	19,946	6,503	48,250	29,997	215,000
Dec.	119,226	20,469	6,236	47,750	32,764	227,500
1955:						
Jan.	124,318	23,875	6,126	.....	.....	235,000
Feb.	117,104	.....	.....	.....	.....	.....

Source: International Rubber Study Group. * Estimated.

U. S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

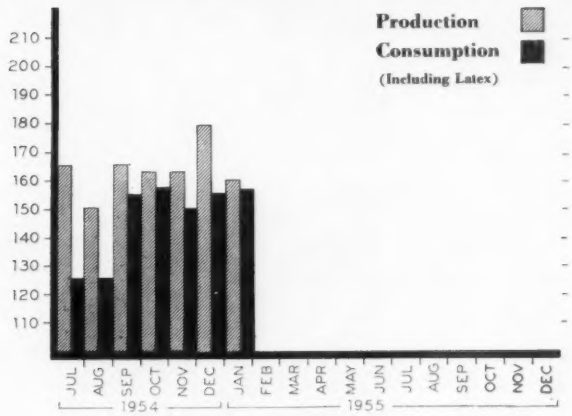
Year	Balata: Tons	Balata: Value	Jelutong: Tons	Jelutong: Value	Gutta-Percha & Other Guttas: Tons	Gutta-Percha & Other Guttas: Value
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1952	988	762,994	1,636	2,094,983	282	385,890
1953	1,619	866,248	1,027	1,166,837	235	303,116
1954:						
Apr.	131	64,025	226	312,654	54	45,733
May	90	35,350	192	232,496	27	37,329
June	87	36,745	318	392,687	97	126,979
July	104	54,957	201	240,477	24	37,749
Aug.	30	23,404	151	200,944	58	68,298
Sept.	107	43,193	313	335,832	37	32,492
Oct.	85	49,323	263	328,656	14	24,116
Nov.	108	76,392	156	188,426	27	49,170
Dec.	83	49,271	145	169,503	17	20,087
1955:						
Jan.	41	48,160	205	247,639	12	24,628

Source: U. S. Department of Commerce.

STATISTICS at a glance

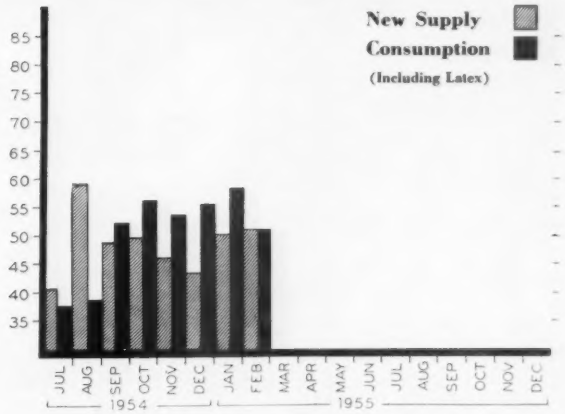
NATURAL RUBBER—WORLD

(thousands of long tons)



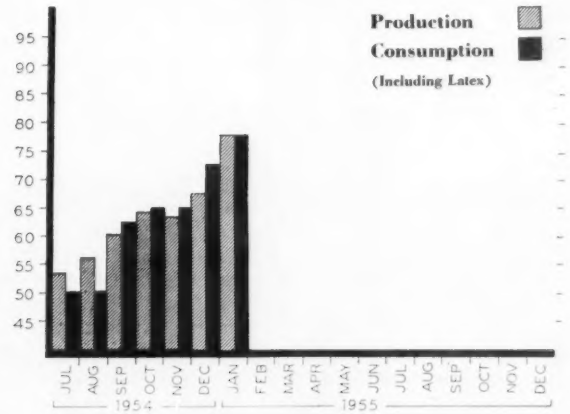
NATURAL RUBBER—UNITED STATES

(thousands of long tons)



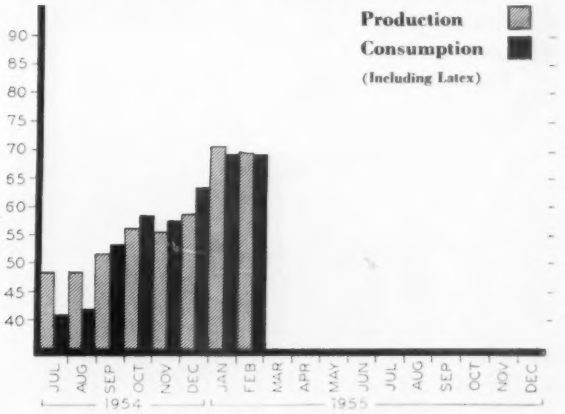
SYNTHETIC RUBBER—WORLD

(thousands of long tons)



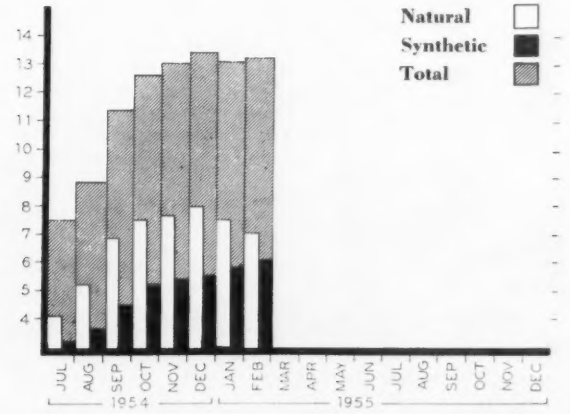
SYNTHETIC RUBBER—UNITED STATES

(thousands of long tons)



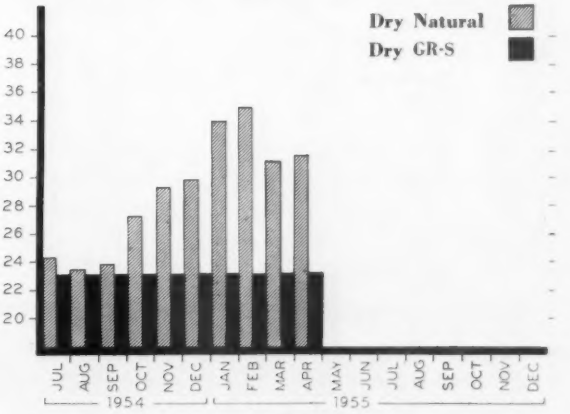
LATEX CONSUMPTION IN THE U. S.

(thousands of long tons)



PRICES—NATURAL AND SYNTHETIC

(cents per pound)



Synthetic Rubber in the United States

(All Quantities in Long Tons)

New Supply

Year	GR-S	Neoprene	Butyl	N-Type	Total
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,539	35,215	54,046	11,072	410,932
1950	378,887	50,067	60,915	12,037	501,906
1951	704,529	58,907	76,475	15,333	855,244
1952	654,854	65,745	81,630	16,228	818,447
1953	680,728	80,495	79,801	20,198	861,222
1954	490,405	69,150	58,802	21,396	639,753
1954:					
July	36,803	4,673	4,960	1,814	48,250
Aug.	38,646	5,313	5,003	1,624	50,586
Sept.	41,120	6,036	4,675	1,718	53,549
Oct.	43,938	6,644	5,117	1,864	57,563
Nov.	43,130	6,839	5,060	1,913	56,942
Dec.	47,356	6,206	4,666	2,068	60,296
1955:					
Jan.	59,043	6,983	3,220	2,099	71,345
Feb.	56,442	6,910	3,727	1,729	68,808
Mar.	65,233	7,132	5,256	2,158	79,779

Consumption

1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	66,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,500	13,066	758,897
1952	666,420	55,522	71,229	13,866	807,037
1953	624,181	65,900	77,826	16,929	784,836
1954	500,345	57,203	61,464	17,715	636,727
1954:					
July	32,800	3,499	4,108	1,145	41,552
Aug.	32,396	4,647	3,569	1,439	42,051
Sept.	42,198	5,049	5,138	1,493	53,878
Oct.	47,063	4,931	4,711	1,604	58,309
Nov.	46,409	5,276	3,967	1,635	57,287
Dec.	52,475	5,434	4,583	1,638	64,130
1955:					
Jan.	56,371	5,676	4,478	1,854	68,379
Feb.	56,000	5,476	4,312	1,826	67,614
Mar.	63,757	6,408	4,837	2,096	77,098

Exports

1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,825	216	1,725	9,249
1952	9,467	9,813	126	2,695	22,101
1953	7,692	11,494	237	3,245	22,668
1954	11,069	12,062	2,831	4,155	30,117
1954:					
July	1,126	1,220	421	358	3,125
Aug.	1,314	945	384	307	2,950
Sept.	785	978	53	270	2,086
Oct.	1,284	1,301	189	455	3,229
Nov.	659	1,081	575	433	2,748
Dec.	994	1,088	140	396	2,618
1955:					
Jan.	1,381	1,046	716	194	3,337
Feb.	1,331	1,049	370	259	3,009
Mar.	1,356	1,048	543	226	3,173

Stocks

1946	81,486	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,942	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,821	129,912
1952	83,861	8,535	22,716	3,875	118,987
1953	135,153	11,480	24,866	4,346	175,845
1954	115,499	11,349	19,267	4,280	150,395
1954:					
July	128,752	11,315	18,150	4,727	162,944
Aug.	135,164	10,710	19,672	4,613	170,159
Sept.	128,313	10,288	18,513	4,548	161,662
Oct.	127,204	11,038	18,653	4,272	161,167
Nov.	121,772	11,429	19,338	4,366	156,905
Dec.	115,499	11,349	19,247	4,080	150,175
1955:					
Jan.	114,976	11,598	17,079	4,160	147,813
Feb.	111,796	10,555	15,424	3,885	141,660
Mar.	114,048	11,055	15,148	3,660	143,911

Source: U. S. Department of Commerce.

Natural and Synthetic Rubber Latex in the United States

(All Quantities in Long Tons)

New Supply

Year	Natural	GR-S	Neoprene	N-Type	Total Synthetic	Grand Total
1943	1,890	194	1,512	.....	1,706	3,596
1944	3,090	6,580	4,683	.....	11,263	14,353
1945	4,768	15,176	7,077	.....	22,253	27,021
1946	8,012	24,810	13,595	.....	38,405	46,417
1947	17,675	22,474	6,089	.....	28,563	46,238
1948	32,630	21,494	5,022	.....	26,516	59,146
1949	29,974	21,357	3,651	.....	25,008	54,982
1950	54,401	31,339	5,725	.....	37,064	91,465
1951	54,963	32,972	6,866	2,948	42,786	97,749
1952	48,228	42,273	7,598	4,164	54,035	102,263
1953	75,511	48,112	9,026	5,844	62,982	138,493
1954	74,483	48,379	8,214	6,866	63,459	137,942
1954:						
Mar.	5,682	4,142	709	483	5,324	11,006
Apr.	5,663	4,046	803	461	5,310	10,973
May	3,806	3,838	680	623	5,141	8,947
June	6,590	4,019	620	585	5,224	11,814
July	5,236	2,589	448	643	3,680	8,916
Aug.	7,571	1,995	756	682	3,433	11,004
Sept.	6,480	4,190	676	581	5,447	11,927
Oct.	7,210	5,190	742	780	6,712	13,922
Nov.	6,335	5,115	717	558	6,390	12,725
Dec.	8,888	5,238	729	624	6,591	15,479
1955:						
Jan.	7,853	6,199	617	624	7,440	15,293
Feb.	6,110	5,634	797	641	7,072	13,182
Mar.	....	7,078	854	672	8,604	.....

Consumption[1]

1943	9,578	150	1,400	....	1,550	11,128
1944	6,085	6,000	4,400	....	10,400	16,485
1945	3,886	14,500	6,800	....	21,300	25,186
1946	5,714	23,500	13,000	....	36,500	42,214
1947	13,909	22,500	6,500	....	29,000	42,909
1948	28,489	21,500	5,250	....	26,750	55,239
1949	36,117	21,500	3,750	....	25,250	61,367
1950	56,138	31,000	5,500	....	36,500	92,638
1951	46,750	31,031	6,279	2,628	39,938	86,688
1952	53,567	40,562	7,368	3,093	51,023	104,590
1953	67,375	46,473	7,981	3,654	58,108	125,483
1954	75,931	44,173	7,251	4,507	55,931	131,862
1954:						
Mar.	6,610	3,982	729	335	5,046	11,656
Apr.	5,892	3,748	603	324	4,675	10,567
May	5,969	3,394	586	348	4,328	10,297
June	5,884	3,653	629	402	4,684	10,568
July	4,298	2,587	482	296	3,365	7,663
Aug.	5,228	2,834	561	351	3,746	8,974
Sept.	6,903	3,599	628	379	4,606	11,509
Oct.	7,527	4,347	612	376	5,335	12,862
Nov.	7,622	4,411	631	411	5,453	13,075
Dec.	7,671	4,575	600	460	5,635	13,306
1955:						
Jan.	7,355	4,537	661	506	5,704	13,059
Feb.	7,066	4,881	689	501	6,071	13,137
Mar.	8,231	5,617	889	457	6,963	15,194

Stocks at End of Period

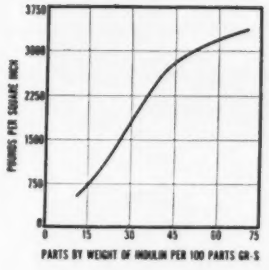
1943	5,638	....	....	....	....	5,638
1944	2,443	....	....	....	....	2,443
1945	3,121	....	....	....	....	3,121
1946	4,865	....	....	....	....	4,865
1947	5,033	....	....	....	....	5,033
1948	11,235	....	....	....	....	11,235
1949	5,063	....	....	....	....	5,063
1950	4,927	....	....	....	....	4,927
1951	4,752	3,727	1,245	532	5,504	10,256
1952	6,201	5,040	1,019	902	6,961	13,162
1953	13,532	4,794	1,117	721	6,632	20,164
1954	11,133	5,134	1,087	811	7,032	18,165
1954:						
Mar.	11,870	5,247	975	588	6,810	18,680
Apr.	10,803	5,273	1,062	600	6,935	17,738
May	8,907	5,180	1,110	655	6,945	15,852
June	9,460	5,591	1,020	646	7,257	16,717
July	10,171	5,363	1,004	831	7,198	17,369
Aug.	12,009	4,220	1,019	993	6,232	18,241
Sept.	11,546	4,504	984	908	6,396	17,942
Oct.	10,952	4,745	1,001	950	6,696	17,648
Nov.	9,759	4,943	1,055	939	6,937	16,696
Dec.	9,933	5,134	1,087	811	7,032	16,965
1955:						
Jan.	9,684	5,861	1,067	812	7,740	17,424
Feb.	8,619	5,753	879	663	7,295	15,914
Mar.	7,701	6,862	867	578	8,307	16,008

Source: U. S. Department of Commerce.
Note: (1) GR-S and Neoprene consumption estimated through 1950.

INDULIN 70-GR-S

for

TEAR RESISTANCE



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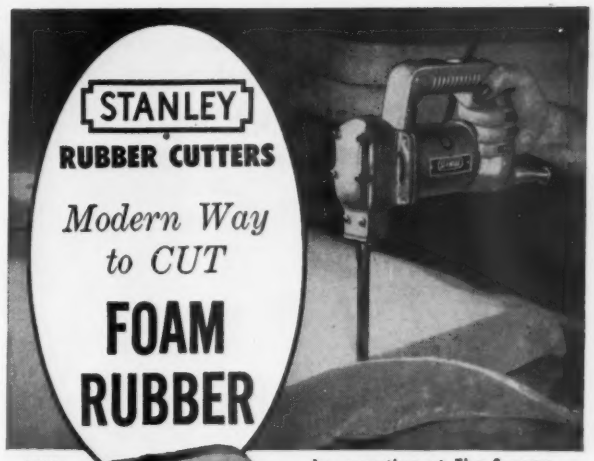

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Rubber Industry Employment Earnings and Hours

All Rubber Products

Mo.	1954 Production Workers (thousands)	1954 Average Weekly Earnings	1954 Average Weekly Hours	1954 Average Hourly Earnings	1955 Production Workers (thousands)	1955 Average Weekly Earnings	1955 Average Weekly Hours	1955 Average Hourly Earnings
Jan.	205.7	$75.08	38.7	$1.94	210.5	$84.25	41.3	$2.04
Feb.	202.9	75.47	38.9	1.94	210.4	....	....	....
Mar.	199.4	74.31	38.5	1.93	....	....	....	....
Apr.	195.2	75.08	38.7	1.94	....	....	....	....
May	197.0	77.81	39.7	1.96	....	....	....	....
June	198.4	79.60	40.2	1.98	....	....	....	....
July	173.1	76.83	39.4	1.95	....	....	....	....
Aug.	177.0	76.25	39.1	1.95	....	....	....	....
Sept.	198.9	77.81	39.3	1.98	....	....	....	....
Oct.	204.2	81.20	40.4	2.01	....	....	....	....
Nov.	204.6	83.02	41.1	2.02	....	....	....	....
Dec.	209.3	85.07	41.7	2.04	....	....	....	....
Tires and Tubes								
Jan.	86.4	82.88	37.5	2.21	87.6	97.41	41.1	2.37
Feb.	85.3	83.03	37.4	2.22	....	....	....	....
Mar.	84.7	80.89	36.6	2.21	....	....	....	....
Apr.	83.2	84.14	37.9	2.22	....	....	....	....
May	83.9	88.65	39.4	2.25	....	....	....	....
June	85.0	92.06	40.2	2.29	....	....	....	....
July	67.3	87.01	38.5	2.26	....	....	....	....
Aug.	68.0	85.65	37.4	2.29	....	....	....	....
Sept.	85.2	86.18	38.3	2.25	....	....	....	....
Oct.	86.5	90.39	39.3	2.30	....	....	....	....
Nov.	83.7	94.54	40.4	2.34	....	....	....	....
Dec.	87.0	98.18	41.6	2.36	....	....	....	....
Rubber Footwear								
Jan	21.5	62.98	38.4	1.64	22.1	68.97	40.1	1.72
Feb.	20.5	65.57	39.5	1.66	....	....	....	....
Mar.	19.6	65.51	39.7	1.65	....	....	....	....
Apr.	19.2	63.58	38.3	1.66	....	....	....	....
May	19.8	65.46	39.2	1.67	....	....	....	....
June	19.8	67.30	40.3	1.67	....	....	....	....
July	20.1	68.45	40.5	1.69	....	....	....	....
Aug.	20.5	66.40	40.0	1.66	....	....	....	....
Sept.	21.0	66.08	39.1	1.69	....	....	....	....
Oct.	21.9	71.34	41.0	1.74	....	....	....	....
Nov.	22.3	71.51	41.1	1.74	....	....	....	....
Dec.	22.3	71.69	41.2	1.74	....	....	....	....
All Other Rubber Products								
Jan.	97.8	70.62	39.9	1.77	100.8	76.08	41.8	1.82
Feb.	97.1	70.40	40.0	1.76	....	....	....	....
Mar.	95.1	70.22	39.9	1.76	....	....	....	....
Apr.	92.8	69.30	39.6	1.75	....	....	....	....
May	93.3	70.98	40.1	1.77	....	....	....	....
June	93.6	70.98	40.1	1.77	....	....	....	....
July	85.7	70.62	39.9	1.77	....	....	....	....
Aug.	88.5	71.15	40.2	1.77	....	....	....	....
Sept.	92.7	72.36	40.2	1.80	....	....	....	....
Oct.	95.8	74.98	41.2	1.82	....	....	....	....
Nov.	98.6	75.71	41.6	1.82	....	....	....	....
Dec.	100.0	76.44	42.0	1.82	....	....	....	....

Source: U. S. Department of Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who work during, or received pay for, any part of the pay period ending nearest the 15th of the month. These employment series have been adjusted to first quarter 1951 benchmark levels indicated by data from government social insurance programs. Hours and earnings data pertain only to production and related workers.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1948	1949	1950	1951	1952	1953	1954	1955
Jan.	36.09	33.37	31.89	45.04	42.96	33.24	34.15	35.07
Feb.	33.63	33.41	32.79	(a)	41.64	33.76	35.00	35.04
Mar.	35.04	33.44	32.65	46.06	41.70	34.10	35.23	34.33
Apr.	38.10	33.84	33.23	46.06	41.79	33.85	35.22	34.23
May	38.57	33.73	33.64	46.06	39.98	34.30	35.34	....
June	38.12	33.56	34.61	46.06	41.31	34.11	35.17	....
July	34.89	32.99	38.11	46.21	40.37	34.20	35.37	....
Aug.	32.23	32.06	38.93	35.93	40.42	33.82	35.19	....
Sept.	31.92	30.94	41.62	36.20	39.75	33.69	35.46	....
Oct.	32.01	30.32	40.66	38.13	37.52	33.53	35.24	....
Nov.	32.15	30.52	43.11	42.70	35.59	33.60	34.80	....
Dec.	32.90	31.08	43.37	43.32	33.76	33.52	35.03	....
Average for Year	34.64	32.44	37.05	42.43	39.71	33.81	35.10	....

Note: The Government established a ceiling price of 45.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Production Index for the Rubber Industry

(1947-1949 = 100)

(Based on man-hours)

	1953	1954	1955		1953	1954	1955
Jan.	132	114	143	July	114	85	...
Feb.	140	114	141	Aug.	122	94	...
Mar.	143	118	...	Sept.	122	118	...
Apr.	140	116	...	Oct.	127	132	...
May	137	118	...	Nov.	120	124	...
June	131	121	...	Dec.	111	127	...

Sales by the Rubber Industry

(in Millions of Dollars*)

	1953	1954	1955		1953	1954	1955
Jan.	424	348	405	July	448	374	...
Feb.	435	351	...	Aug.	409	337	...
Mar.	473	388	...	Sept.	416	334	...
Apr.	444	375	...	Oct.	395	332	...
May	422	357	...	Nov.	346	388	...
June	436	377	...	Dec.	369	407	...

Rubber Manufacturers' Inventories

(in Millions of Dollars*)

	1953	1954	1955		1953	1954	1955
Jan.	866	844	798	July	925	784	...
Feb.	868	857	...	Aug.	897	761	...
Mar.	880	849	...	Sept.	908	804	...
Apr.	874	812	...	Oct.	881	838	...
May	888	810	...	Nov.	867	819	...
June	914	829	...	Dec.	868	829	...

Source: U. S. Department of Commerce.
Notes: * Adjusted for seasonal variation.

No. 1 R.S.S.—Annual Average Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1913	113	59	82.04	1934	15⅞	8¾	12.92
1914	93	56	65.33	1935	13¾	10½	12.37
1915	79	58½	65.85	1936	23	13½	16.41
1916	102	55	72.50	1937	26⅞	14	19.39
1917	90	52	72.23	1938	17-⅞	10¼	14.64
1918	70	40	60.15	1939	24	14⅛	17.57
1919	57	38½	48.70	1940	24	18¼	20.10
1920	56½	16	36.30	1941	24⅞	19⅛	22.40
1921	21¼	11½	16.36	1942	22½	22½	22.50
1922	28⅛	13⅝	17.50	1943	22½	22½	22.50
1923	37⅛	24¾	29.45	1944	22½	22½	22.50
1924	40⅛	17⅝	26.20	1945	22½	22½	22.50
1925	121	34⅜	72.46	1946	22½	22½	22.50
1926	88½	36¾	48.50	1947	25	14	20.00
1927	41¾	33	37.72	1948	25	18	21.99
1928	41¼	17	22.48	1949	19¾	15⅞	17.57
1929	26⅞	15½	20.55	1950	86	18	41.10
1930	16½	7½	11.98	1951	76	52	(a)
1931	8⅜	4¼	6.17	1952*	33	26½	29.15
1932	4¼	2½	3.49	1953	31⅞	19⅞	24.21
1933	9⅞	2⅞	5.96	1954	34½	19½	23.61

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year. * Free trading was resumed on July 1, 1952; figures represent only July through December, 1952.

No. 1 R.S.S.—Monthly Average Prices

(New York Market—Cents per pound)

	1948	1949	1950	1951	1952	1953	1954	1955
Jan.	21.83	19.23	18.33	71.21	....	29.40	20.22	33.92
Feb.	20.42	18.49	19.40	73.61	....	27.57	19.98	34.90
Mar.	20.33	19.08	19.86	72.05	....	26.59	20.16	31.08
Apr.	22.87	18.53	23.51	....	....	24.66	22.06	31.75
May	23.39	17.92	28.07	....	....	25.52	21.96	....
June	22.80	16.36	30.92	....	....	24.42	23.01	....
July	24.24	16.45	39.10	....	30.52	23.64	24.12	....
Aug.	23.63	16.60	51.63	....	29.36	23.36	23.26	....
Sept.	22.81	17.58	55.98	....	27.42	23.06	23.99	....
Oct.	22.13	16.31	62.19	....	27.26	20.82	26.57	....
Nov.	20.52	16.70	73.05	....	29.25	20.58	28.07	....
Dec.	18.86	17.53	71.20	....	31.26	20.92	29.88	....
Average for Year	21.99	17.57	41.10	(a)	29.15	24.21	23.61	....

Note: (a) Free trading suspended March 31, 1951, and resumed on July 1, 1952.

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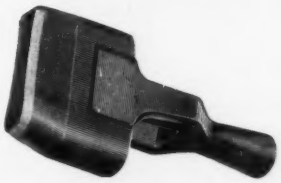

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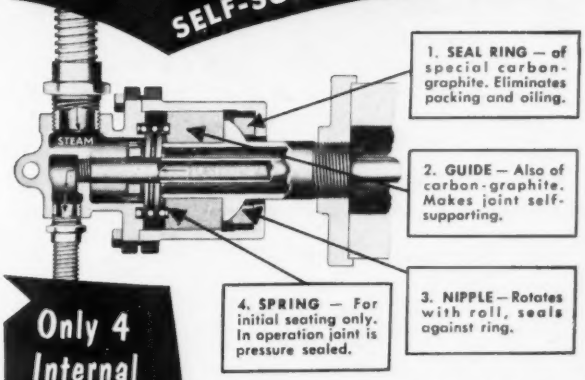
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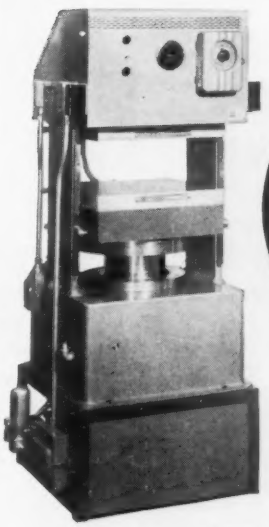

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Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11 016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total) ...	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49.148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	31,584	43,466	1,467	76,517	76,369	10.638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car	26,729	34,226	723	61,678	65,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952 (total)	29,484	54,342	1,520	85.346	90.411	14,110
Passenger Car.	24,106	45,458	741	70,305	74,341	11,251
Truck and Bus	5,378	8,884	779	15,041	16,070	2,859
1953 (total)	37,949	55,124	1,543	94.617	96,150	15.720
Passenger Car	33,106	45.798	809	79,713	81.455	13.044
Truck and Bus	4,843	9.326	734	14,904	14.696	2.676
1954 (total)	33,338	55,154	1,754	90,246	89,153	14.774
Passenger Car.	29,746	47.043	928	77,717	76,806	12,228
Truck and Bus	3,592	8,111	826	12,529	12,347	2,546
1954:						
June (total)	2,890	6,029	160	9,079	8.796	15.218
Passenger Car.	2,587	5.326	89	8.002	7.755	12.323
Truck and Bus	303	703	71	1,076	1,041	2,895
July (total)	2,782	5,948	155	8,884	6.360	12,640
Passenger Car.	2,516	5,222	73	7,812	5,605	10.063
Truck and Bus	265	725	82	1,073	755	2,577
Aug. (total)	2,527	5,429	123	8,080	5,427	9,985
Passenger Car.	2,284	4,605	73	6,962	4,710	7,797
Truck and Bus	243	824	51	1,118	717	2,188
Sept. (total) ...	1,601	4,537	130	6,269	7,279	11,184
Passenger Car.	1,375	3,825	73	5,273	6,242	8,951
Truck and Bus	227	712	57	995	1,037	2,233
Oct. (total)	1,868	4,251	147	6,266	7,869	12,799
Passenger Car.	1,617	3,423	81	5,121	6,702	10,531
Truck and Bus	251	828	67	1,146	1,167	2,268
Nov. (total)	3,124	3,560	158	6,842	7,626	13.676
Passenger Car.	2,823	2,844	92	5,759	6,480	11,331
Truck and Bus	301	716	67	1,084	1,145	2,345
Dec. (total)	3,707	3,470	169	7,346	8,444	14,774
Passenger Car.	3,383	2,844	88	6,315	7,215	12.228
Truck and Bus	325	625	81	1,031	1,229	2,546
1955:						
Jan. (total)	3,785	4,967	159	8,911	9,040	14,949
Passenger Car.	3,481	4,139	79	7,699	7,797	12,363
Truck and Bus	303	827	81	1,211	1,243	2,586
Feb. (total)	3,833	4,281	157	8,272	8,745	15,368
Passenger Car.	3,540	3,551	83	7,174	7,549	12,687
Truck and Bus	294	730	74	1,098	1,196	2,681
Mar. (total)	4,780	4,926	201	9,907	10,083	15,609
Passenger Car.	4,326	4,254	104	8,685	8,810	12,875
Truck and Bus	454	672	96	1,222	1,273	2,734

Source: The Rubber Manufacturers Association, Inc.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	875,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1942	220,814	133,083	353,897	1952	4,320,794	1,212,790	5,533,584
1943	0	4,501	4,501	1953	6,121,787	1,202,196	7,323,983
1944	0	124,819	124,819	1954	5,558,897	1,038,045	6,596,942
1954:							
Jan.	454,562	96,167	550,729	July	451,663	78,507	530,170
Feb.	446,676	87,141	533,817	Aug.	445,306	75,835	521,141
Mar.	531,529	101,177	632,706	Sept.	300,998	68,618	369,616
Apr.	534,667	96,723	631,390	Oct.	221,195	66,138	287,160
May	497,062	91,226	588,288	Nov.	498,248	89,232	587,480
June	507,055	91,470	598,525	Dec.	669,936	95,811	765,747
1955:							
Jan.	635,513	89,676	725,189	July	.....	.....	.....
Feb.	677,705	67,061	744,766	Aug.	.....	.....	.....
Mar.	791,280	102,992	894,272	Sept.	.....	.....	.....
Apr.	.....	.....	.....	Oct.	.....	.....	.....
May	.....	.....	.....	Nov.	.....	.....	.....
June	.....	.....	.....	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
Year	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26.833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	..
1951	32,151	32,284	1,071	65,507	67,249	10,094
1952	29,451	32,985	1,014	63,449	65,073	12,036
1953	37,957	36,072	878	74,907	74,425	11.874
1954	25,117	35,204	947	61,268	58,398	9,299
1954:						
July	2,707	3,471	87	6,265	4,132	8,429
Aug.	2,174	3,504	69	5,748	3,773	6,588
Sept.	1,130	2,839	64	4,034	4,490	7,179
Oct.	429	2,567	92	3,087	3,953	8,313
Nov.	450	2,142	90	2,681	3,246	8,706
Dec.	476	2,019	74	2,569	3,201	9,299
1955:						
Jan.	413	3,629	74	4,116	3,089	8,252
Feb.	352	2,430	80	2,862	2,850	8,244
Mar.	491	2,732	105	3,327	2,234	8,217

Source: The Rubber Manufacturers Association, Inc.

Vinyl and Vinyl Copolymer Resins—Sales

(Thousands of Pounds—Resin Content)

	Polyvinyl Chloride and Copolymer Resins							All Other Vinyl Resins		
	Film	Sheeting	Molding & Extrusion	Textile & Paper Treating	Flooring	Protective Coatings	All Other Uses	Adhesives	All Other Uses	Grand Total
1953	63,691	62,385	129,215	52,353	22,152	22,823	27,790	22,411	77,478	480,299
1953										
July	4,638	2,821	8.580	3,376	1,507	1,798	2,500	1,859	6,402	33,481
Aug.	4,903	4,609	8 650	3,851	2,063	1,850	2,412	1,721	6,121	36,180
Sept.	5,318	4,855	9 485	4,281	2,073	1,948	2,284	2,000	5,824	38,066
Oct.	5,568	5,081	10,219	4,542	2,279	1,707	2.941	2,049	7,118	41,505
Nov.	4,507	4,126	9,443	3,615	1,447	1,561	2,446	1,755	6,711	35,610
Dec.	4,965	4,579	12,469	4,024	1,549	1,789	3,456	1,721	7,123	41,676
1954										
Jan.	4,869	5,435	10,120	4,638	911	1,614	1,731	1,825	5,988	37.131
Feb.	5,170	5,720	10.711	4,346	1,170	1,829	2,407	2,038	6,712	40.103
Mar.	7,348	6,790	12,255	4,826	1,432	2,029	2,392	2,622	6,127	45,819
Apr.	6,457	6.455	12,568	4,479	1,894	1,864	2,311	2,407	6,325	44,700
May	4,775	3,840	11.096	3,582	3,256	1,730	2,643	2,578	6,010	39,510
June	5,100	3,003	10.529	3,552	3,554	1,916	2.744	2,500	5,343	38,241
July	5,114	3,441	9,648	3,105	3,356	1,859	2,598	1,951	5,010	36.082
Aug.	7,078	4,522	14.541	4.259	3,931	2.198	3.407	2.444	5.804	48.183
Sept.	5,665	4,340	13,454	3,784	3,797	2,242	3,779	2,379	5,768	45,208
Oct.	....	....	.....	....	....	....	....	....	....	....
Nov.	....	....	....	....	....	....	....	....	....	....
Dec.	....	....	....	....	....	....	....	....	....	....

Source: Chemical Division, U. S. Tariff Commission.

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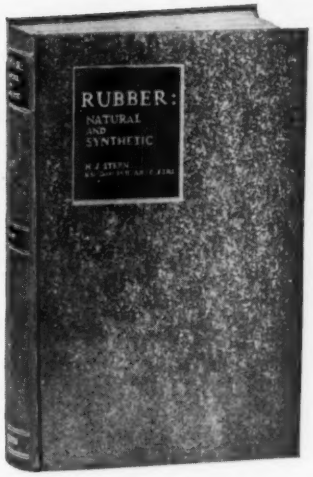

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About the Author—

Dr. Stern has been engaged as a chemist in the rubber industry for more than 25 years and since 1935 has practiced successfully in London as a Consultant. He is the author of "Practical Latex Work" and of many publications concerned with the scientific and technological aspects of natural and synthetic rubber.

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1. **Historical Introduction; Mastication; Vulcanization.**
2. **Plantation Rubber.**
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8. **Synthetic Rubber (History and Development).**
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11. **Synthetic Resins; Plastics.**
12. **Manufacturing Processes (of various rubber products).**
13. **Testing and Analysis.**

Sources of Further Information; Metric Equivalents; Subject Index.

Various Compounding Materials Consumed by the Rubber Industry

Material	1947	1948	1949	1950	1951	1952	1953
Antimony, Primary:							
Short tons	39	41	55	103[c]	19[c]	66	20
% of total	.002	.003	.005	.007	.001	.004	.001
Asphalt: [a]							
Short tons	32,113	19,967	18,050	26,819	21,414	33,288	.....
% of total	0.7	0.4	0.3	0.3	0.3	0.4	.....
Barite (Barytes):							
Short tons	17,000	18,000	14,000	19,000	15,000	14,000	.....
% of total	3.1	2.85	2.53	3.31	2.13	2.0	.....
Carbon Black:							
Short tons	471,790	435,282	383,565	515,184	530,614	537,273	566,797
% of total	94.3	95.5	93.3	92.9	93.9	93.1	94.4
Clay, Kaolin:							
Short tons	166,201	176,965	197,341	263,306	231,331	240,982	.....
% of total	11.5	11.3	13.1	15.0	12.7	13.2	.....
Clay, Fire & Stoneware:							
Short tons	17,970	15,480	27,148	9,500	.....	9,322	.....
% of total	0.2	0.2	0.3	0.1	.....	0.1	.....
Lime:							
Short tons	589	1,154	715	908	1,126	2,000	.....
% of total	0.01	0.02	.0002	.0002	[d]	[d]	.....
Litharge:							
Short tons	2,205	2,835	1,398	3,047	2,641	2,109	.....
% of total	1.3	1.8	1.2	1.7	1.7	1.5	.....
Lithopone:							
Short tons	3,085	4,192	3,245	4,092	3,295	1,523	1,723
% of total	1.9	3.0	4.1	3.9	3.2	2.5	3.3
Mica, Ground:							
Short tons	3,900	4,372	3,856	5,776	6,551	5,126	.....
% of total	6.0	7.0	7.0	8.0	9.0	7.0	.....
Sulfur:							
Short tons	72,800	70,560	59,360	75,000	75,000	75,000	.....
% of total	1.8	1.7	1.5	1.3	1.6	1.6	.....
Talc: [b]							
Short tons	71,840	66,226	53,400	75,900	70,970	64,476	.....
% of total	13.9	13.0	12.0	12.0	11.2	10.9	.....
Zinc Oxide:							
Short tons	82,248	82,895	58,496	82,944	71,507	72,774	78,439
% of total	51.2	54.9	52.5	51.6	48.4	51.2	52.7

Source: U. S. Bureau of Mines.
Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes prophyllite and ground soapstone. (c) Does not include precipitated antimony sulfide as in previous years. (d) Negligible.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	New Supply	Consumption—Tons	Consumption—% to Crude [a]	Exports	Stocks On Hand at End of Period
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007 [b]	254,820	64.6	30,405	42,532
1943	304,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	26.6	14,722	45,082
1952	274,981	280,002	22.2	11,180	30,664
1953	298,336	285,050	21.3	11,597	32,319
1954	258,101	249,049	20.2	10,232	30,746
1954:					
May	21,316	20,536	19.7	1,071	31,105
June	22,342	22,321	20.0	1,068	30,845
July	18,041	16,301	20.5	586	31,304
Aug.	15,519	17,660	22.0	647	27,692
Sept.	22,352	19,926	18.8	641	29,632
Oct.	23,566	22,098	19.3	808	30,395
Nov.	22,986	22,321	20.2	862	29,451
Dec.	25,790	24,546	20.5	816	30,746
1955:					
Jan.	25,336	25,322	20.2	1,041	29,656
Feb.	25,444	24,333	20.5	1,085	30,125
Mar.	29,653	28,685	21.2	1,063	30,069

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton: Tire Cord Not Woven	Cotton: Cord Fabric Woven	Cotton: Chafer and All Other Tire Fabrics	Cotton: Total	Rayon and Nylon [b]: Tire Cord not Woven	Rayon and Nylon [b]: Tire Cord and Other Tire Fabrics	Rayon and Nylon [b]: Total
1952:							
Jan.-Mar.	11,226	36,378	12,971	60,575	14,434	72,249	86,683
Apr.-June	4,661	24,612	10,742	40,015	16,874	81,249	98,123
July-Sept.	335	9,257	9,460	19,052	18,128	80,355	98,483
Oct.-Dec.	c	4,728a	11,580	16,308	19,436	81,171	100,607
Total*	15,887	74,834	48,280	139,001	68,873	323,106	391,979
1953:							
Jan.-Mar.	c	4,378a	15,477	19,855	20,487	91,742	112,229
Apr.-June	c	5,713a	15,880	21,593	18,906	95,711	114,617
July-Sept.	c	3,562a	13,193	16,755	18,597	89,821	108,418
Oct.-Dec.	c	2,460	11,569	14,029	19,664	79,259	98,293
Total*	c	16,113	57,103	73,216	77,654	370,137	447,791
1954:							
Jan.-Mar.	c	2,585	13,229	15,814	17,297	78,388	95,685
Apr.-June	c	4,067	12,867	16,934	15,257	72,332	87,589
July-Sept.	c	2,104	9,321	11,425	12,851	56,890	69,741
Oct.-Dec.	c	3,743	12,476	16,219	14,609	86,269	100,878
Total	c	9,914	34,664	44,578	42,717	215,491	258,208

Source: Bureau of the Census, U. S. Department of Commerce.
Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord woven. (d) Included with chafer and all other tire fabrics. * Revised.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1948	1949	1950	1951	1952	1953	1954	1955
Jan.	61,308	63,125	66,981	80,670	86,863	89,634	89,852	96,397
Feb.	56,487	57,980	53,274	72,864	82,043	86,458	86,206	.....
Mar.	68,171	73,282	78,780	86,962	87,065	98,158	101,549	.....
Apr.	72,183	75,318	80,350	87,573	98,653	102,044	103,866	.....
May	77,186	81,665	89,035	100,266	101,137	105,918	104,418	.....
June	78,044	83,374	90,174	96,364	99,305	114,703	113,037	.....
July	81,428	83,129	91,677	100,567	105,307	112,960	112,231	.....
Aug.	80,351	84,707	94,507	101,453	102,954	109,124	110,223	.....
Sep.	76,159	80,832	86,725	91,891	100,095	106,158	104,706	.....
Oct.	75,164	79,327	89,067	100,209	103,689	106,037	105,607	.....
Nov.	72,560	76,346	82,688	88,581	91,326	99,210	102,393	.....
Dec.	72,162	75,628	81,032	84,551	95,817	100,225	104,258	.....
	871,270	913,713	994,290	1,091,951	1,154,254	1,230,629	1,238,346	.....

Source: U. S. Bureau of Mines.

Rim Production

	1950	1951	1952	1953	1954
Passenger Car	35,096,404	29,145,367	24,936,844	31,318,461	25,952,322
Truck & Bus	6,625,129	6,877,419	5,752,674	5,228,321	4,463,689
Agricultural	2,853,483	3,019,581	2,073,116	1,943,487	1,297,040
Earth Mover	15,602	28,026	31,791	24,685	21,536
Total	44,590,618	39,070,393	32,794,425	38,514,954	31,734,587

	1954: Oct.	1954: Nov.	1954: Dec.	1955: Jan.	1955: Feb.	1955: Mar.
Passenger Car	1,769,718	2,367,206	3,187,971	3,341,979	3,060,249	3,919,117
Truck & Bus	389,479	390,674	426,620	456,169	415,433	558,758
Agricultural	86,196	100,364	118,336	162,480	155,018	225,915
Earth Mover	1,592	2,013	2,377	2,663	2,124	2,249
Total	2,246,985	2,860,257	3,735,304	3,963,291	3,632,824	4,706,039

Source: The Tire & Rim Association, Inc.

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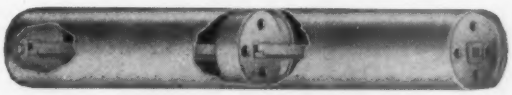

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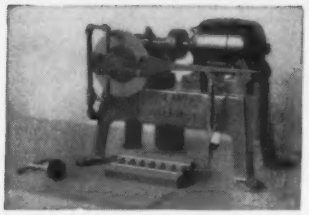

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